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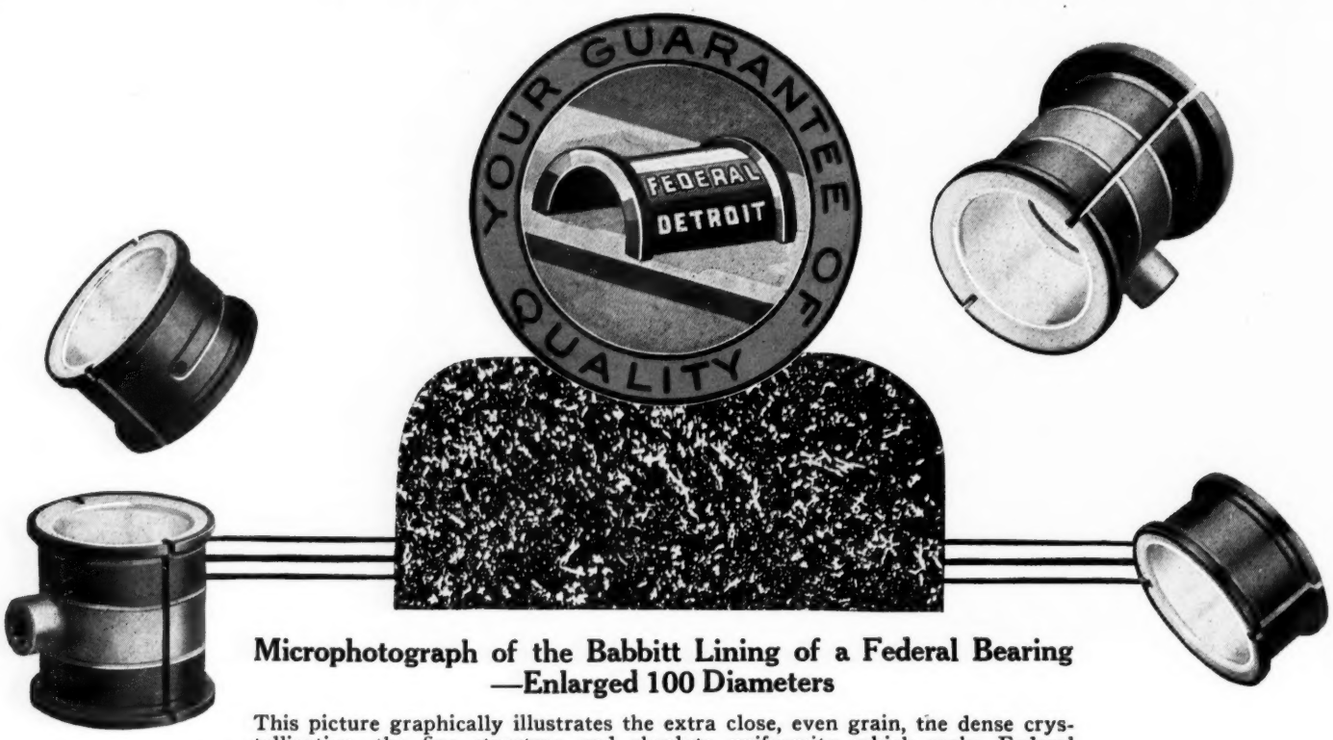
FEDERAL BEARINGS



Microphotograph of the Babbitt Lining of a Federal Bearing —Enlarged 100 Diameters

This picture graphically illustrates the extra close, even grain, the dense crystallization, the fine structure and absolute uniformity which make Federal Bearings so superior in wearing quality and toughness.

This finer crystallization in the Babbitt Lining of Federal Bearings is due to the rapid rate of cooling—which prevents the large and uneven crystallization so noticeable in the bearing pictured below.

Microscope Reveals Outstanding Quality of Federal Bearings

Look at the two microphotographs shown here. They tell a graphic story.

The picture at the top reveals the inherent, structural qualities of the Babbitt Linings of Federal Bearings. Notice the even, close grain, the fine structure and notice especially the absolute uniformity of grain and structure.

This picture shows conclusively *why* Federal Bearings outwear any other make of Bearing on the market—for the microphotograph shows the actual, physical superiority of Federal Bearings — which is due to the Federal Centrifugal Force Process.

The picture below shows an average bearing, used in a well-known make of automobile. Here is revealed the absence of uniformity, the coarseness of grain, the large, uneven crystallization which cause such bearings to break down long before they should.

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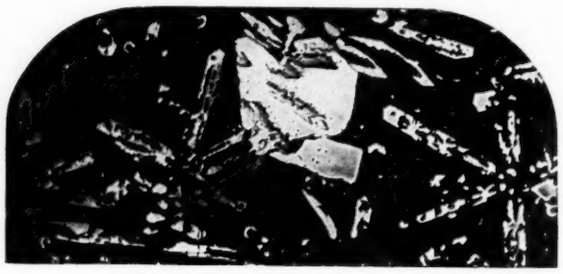

Microphotograph of a Bearing Used by a Well-Known Automobile—Enlarged 100 Diameters

Notice the large and uneven crystallization as compared with the Federal Bearing pictured above. This bearing is uneven in structure and diverse in texture—it will show wear quickly in spots—in other words, will flake off under frictional pull.

The structural and physical defects shown in this microphotograph are not visible to the naked eye—and while it looks like a good bearing upon casual inspection, a microscopic analysis shows that it is not.

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AUTOMOTIVE INDUSTRIES
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VOL. XLVII NEW YORK, THURSDAY, SEPTEMBER 28, 1922 No. 13

South American Market Ripe for Sales Expansion

General Motors' executive paints optimistic picture of present automotive conditions in Latin-America. Lower prices stimulate buying. Stock models gain in popularity. Highway building makes rapid progress. Service facilities being extended everywhere.

By J. D. Mooney*

AUTOMOTIVE sales conditions in Brazil, Uruguay, Argentina, Chile and Peru are everywhere tending to become more favorable. Distributors, jobbers and dealers in these countries are more confident than they have been since the financial depression became so serious eighteen months or two years ago. This was plainly evident in Rio de Janeiro, Sao Paulo, Montevideo, Buenos Aires, Cordoba, Santiago, Valparaiso, Lima and other localities which are the automotive centers of the eastern and western sections of South America.

A great automotive business, firmly founded and efficiently managed, has been built up in these countries. Motor cars, motor trucks, motorcycles and farm tractors are being operated in large numbers. Efficient sales organizations, functioning with energy and merchandising ability, are hard at work promoting the sale of the automobile and its attendant equipment. Service facilities have come into being on a large scale and service is being rendered in a manner deserving of the highest commendation.

THE writer of this article has just returned from a three months' trip through the principal South American countries. The purpose of his visit was to analyze automotive market possibilities.

Here he gives to the readers of Automotive Industries his conclusions drawn from this first-hand investigation. He talks from the standpoint of the American executive interested in increasing foreign sales.

His comments will be of interest to executives throughout the industry.

These are a few of the significant facts presented by a study of the automotive trade in these sections. This trade has grown to large proportions already and there is every reason to expect a gradual but certain enlargement of sales in the months to come, along sound and progressive lines. The automobile is such a transportation necessity and the esteem with which it is held is so high that this development is certain to come and it will accompany the restoration to normal of all the business forces of these countries.

General business has gone far in overcoming its

*Vice-president and general manager, General Motors Export Corporation.

troubles. So has the automotive trade. National industries of the various countries in most cases have gotten back to a much better basis and the feeling is evident that from now on there will be a gradual building up of trade and commerce to levels probably appreciably higher than before the war. Readers of AUTOMOTIVE INDUSTRIES are familiar with the economic influences that are at work, not only favorable but those which are unfavorable. What the expected betterment will mean to them in terms of automotive sales can be well understood by saying that the old stocks of cars and other equipment have been almost entirely disposed of and the buying of new equipment has begun.

PRICES have been brought down in keeping with factory reductions and with the level of exchange values; the result being that motor cars, trucks and tractors of undoubted excellence are being offered at what can only be considered as very low prices.

One thing that the industry must keep clearly in mind is that costs should be brought down to as low a level as possible. Whenever reductions can be made in the selling prices of the new vehicles, these should be passed on to the owner and the user. It is to the credit of the industry that these reductions have been carried on to the ultimate user in nearly every case. The lower the price of the car, truck or tractor, the greater will be the number of persons who can own and use automobiles of every character. This is an axiom of the industry that is being proved in every locality. We must look with favor upon anything that tends to lower the cost of motoring, whether this be in the first cost of the new vehicle or in service and maintenance work.

There is plainly in evidence a trend in favor of the stock model, equipped just as it comes from the factory. Special bodies, special equipment and special finish add materially to the cost of the cars and any added costs therefore limit the number of possible users. The special car, of course, is and will continue to be sold to those users who can afford them; this is good business and the industry is prepared to furnish cars in whatever finish or with whatever equipment may be specified. Nevertheless, the stock model, the cost of which has been brought down to a low point through efficient production methods, is the vehicle that is being sold in the largest volume. This is another favorable tendency, which indicates that the automobile is being considered more widely as a transportation utility vehicle.

The countries of Brazil, Uruguay, Argentina, Chile and Peru have to-day a large mileage of roads usable for automotive vehicles. This is perhaps not widely recognized, as it is usually stated that only a few roads in these countries are passable for motor traffic. The fact is that many localities have not yet developed the automobile as far as the present roads would warrant.

The roads, streets and boulevards of Rio de Janeiro are so fine that many more automobiles should be using them than are now in operation, despite the fact that it is impossible to drive away from the city any distance. The roads of Sao Paulo are excellent and the opening of the new highway to Ribeirao Preto is an automotive event of the first magnitude. This great road stretches some 450 kilometers into the interior and automobiles can be driven over it for hours without shifting gears. A tremendous automotive traffic will soon be using this highway, as will also be the case over other fine roads in this district.

Existing roads in other localities do not halt automotive traffic. In Uruguay and Argentina, for example, automobiles can be driven almost anywhere. Even in the middle of winter we drove many kilometers through the interior of Argentina without difficulty. The road problem in Chile is difficult but the automobile is being introduced there with ability and energy. We may expect much from that country in the next few years. Peru already has some excellent roads and a campaign for further improvement should soon begin to bear fruit.

The automotive representatives in these countries are keenly alive to the road necessities and are taking a leading part in the campaigns now under way for road betterment. These campaigns promise much for the future but we must not overlook the opportunities at present existing for automotive transportation.

The motor truck is slowly winning the position it should occupy in many localities. A motor bus development is now getting under way that should bear the closest attention of the automotive trade. Buses are being put into operation and there is a large demand springing up for such transportation facilities. Successful operation is a proven fact in many centers and this is leading to expansion throughout all these territories.

Operating costs have worked against truck operation for general haulage purposes. Nevertheless, many opportunities exist for truck use and this part of the market is deserving of more attention than it has received.

Much has been said about the subject of service and dealer organizations. It would be well to add here that excellent maintenance work is being done in a large number of localities. Dealer establishments and garages are being opened—or are already in operation—in even the smaller towns and this evidences the widespread use of the automobile, which no longer is confined to the cities.

ARGENTINA, for example, is dotted with service and sales stations. A similar network is being built up in Brazil. These stations are generally well equipped; frequently with excellent facilities for electrical and storage battery maintenance work. Many more cars than formerly was the case are being equipped only with batteries for ignition purposes.

MOONEY makes the following points in connection with his analysis of the automotive market in South America:

Dealers, distributors and jobbers are more confident and prosperous than at any time during the last two years.

* * *

General economic conditions have improved materially and are still getting better.

* * *

Service facilities have been extended beyond the confines of the big cities.

* * *

Utility use of motor vehicles is distinctly on the increase.

* * *

Motor bus development should be watched carefully by American manufacturers.

Low-Priced Bodies Dominant Feature of Closed Car Show

Nine companies exhibit special low-priced jobs at New York Closed Car Show. Seventeen new body models shown by eleven manufacturers. Utility value of closed cars emphasized. Good crowds attend opening. Dealers sponsor successful show.

LOW-PRICED utility closed cars comprise the chief feature of the New York Closed Car Show which opened September 25 in the Grand Central Palace. The whole atmosphere of the show emphasizes the utilitarian character of the closed job. All the new models of this type brought out in recent months are assembled in this exhibit, which gives a striking visualization of a trend in body design that has been evident throughout the industry for some time past. Several new models of the low priced type are being shown for the first time, chief among which are the Maxwell club coupe and the Reo model C coupe and sedan.

Luxurious models are still in evidence, of course, and the higher priced closed jobs predominate in numbers. Even in the case of these models, however, the appeal of color and setting is chiefly utilitarian. Seventeen new body models are shown by 11 manufacturers.

Fairly good crowds are attending the show, although nothing like those which pack the big New York automobile show in mid-winter. The visitors to this exhibit, however, seem to be composed of interested people, most of whom have some idea of purchasing an automobile. The doors of the cars are being opened and shut frequently, and the inside trimming as well as the outside lines are being carefully inspected.

There is every evidence that this show will be a distinct educational force in selling the closed car idea to the general public. Many prospective buyers have wanted closed cars for some time, but the high prices have made it impossible for them to realize their desires. The lower prices of all models, however, together with the large number of business and utility closed jobs on exhibition, undoubtedly will stimulate buying interest materially. Even the casual visitor is sure to be impressed with the fact that the automotive manufacturer has really set himself to the task of providing an all-weather car at a price not too far above the open job to fit the average pocket-book.

More Cheap Models

A year ago the Essex coach caused considerable comment as the first low-priced closed model. This year some ten or twelve models of similar type are being shown. Nearly all of the lower and middle-price car manufacturers have now developed closed jobs of this character. Oakland, Studebaker, Chevrolet, Maxwell, Essex, Hudson, Reo, Dort and Dodge are among those who are now marketing a low-priced closed car.

The show presents the current closed models of nearly all types of the 54 manufacturers represented by metropolitan agencies. Especially noticeable, in addition to the soft top models, were cars showing a trend toward two-door sedans and coupes with the wider windows made possible by this arrangement. Novelties included a Pierce-Arrow limousine with two windshield cleaners and a Dodge Brothers town car, a special job, with the sunshade built integral with the top. A number of exhibitors had special body and paint jobs, the latter decorating the show with frequent bright spots of color.

A new Club Coupe is shown by *Maxwell.* It has quarter windows which drop full length in place of the solid, fabric-covered quarter sections which are generally used in connection with two-passenger coupes. The result is that the car is free from the usual "blind" corner. The driver may signal through the adjustable quarter window instead of through the door.

New Maxwell

The seating space is arranged the same as in the Maxwell roadster. The ventilation features have been given particular attention. A special type of windshield has been adopted for all the Maxwell closed cars. Both sections of it swing outward the upper half being hinged from the top and the lower from the bottom. To keep the windshield weather and water tight the entire assembly is set around a rabbet.

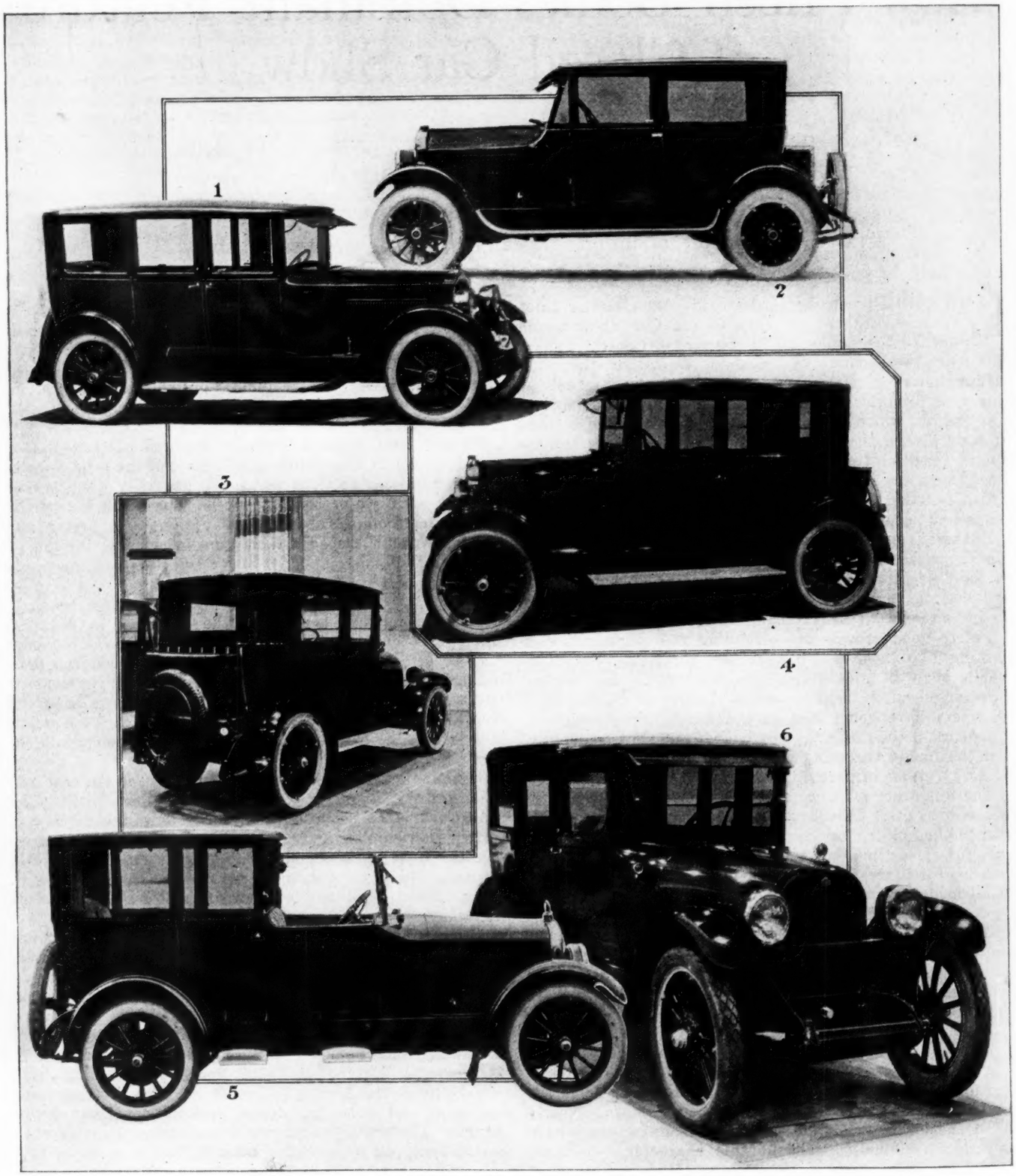
Genuine leather upholstery is employed for the seat and back and the upper section is covered with broadcloth. The hardware is of satin finished nickel and the doors are provided with Yale locks. There is a heavy roller curtain for the rear light. Room for sample cases or luggage is provided under the rear deck which is also equipped with a Yale lock. Another deep compartment for small parcels is located inside back of the seat.

Standard equipment includes a rear vision mirror, windshield wiper, adjustable visor, and ventilating type heater. Price is $985 f. o. b. Detroit.

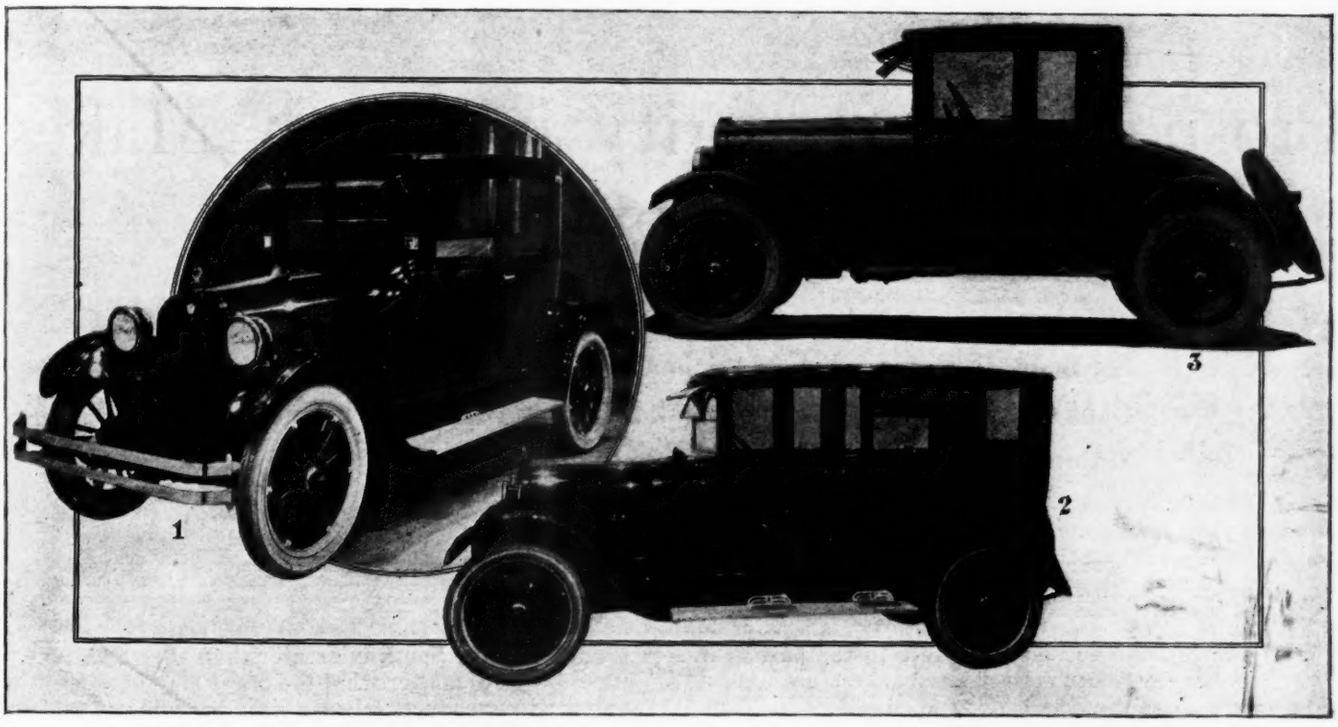
Two new *Chandler* bodies are the limousine at $2895 and the town car, $2895. Both these models are fitted with what has become generally known as "sport" equipment, including aluminum steps with individual fenders and splashers, drum type headlamps and so on. Sliding glass panels divide the driving compartment from the rear compartment and a locking device prevents shifting of the panels. The limousine carries five passengers in the rear and is equipped with all the usual fittings of a car of this class and also has a dictaphone for communication with the driver.

The *Nash* chassis has been changed slightly and a new four-door, 5-passenger sedan is added, this being $2,040. Among the chassis changes are the addition of five cross braces in the frame which still further prevent frame weaving. Although these braces were added primarily to pre-

New Closed Models Making First Appearance at the Show



1—Packard five-passenger limousine-sedan, a newcomer to the single six line. 2—Lexington two-door brougham with chair type front seats. 3—Stephens five-passenger, two-door sedan with tilting front seats. 4—Oakland five-passenger coupe, featuring a Fisher-built body. 5—Chandler town car, seen for the first time at the show. 6—Nash four-door sedan, mounted on the six-cylinder chassis



1—Reo coupe. 2—Reo sedan, both Reo bodies are built of steel and are offered in addition to the aluminum body models. 3—Maxwell Club Coupe which gives clear side vision to the driver

vent flexing of closed bodies, the open bodies are fitted to the same chassis. Another feature of the closed jobs is the copper guttering of the windshield sides to prevent leakage of water at all points.

A new *Oldsmobile* body is the brougham at $1,425. This is a two-door body with a seating capacity of five and uses the tilting front seat. A feature of the design is the rear carrying compartment which is reached from the outside. A cover, curved to conform to the body lines is hinged at the top and can be locked. A strut holds it open when access is desired. The tools are all buttoned to a board which drops from this cover and beneath this is space for a considerable amount of luggage.

Two new steel bodies are added to the *Reo* line, a sedan at $1,885 and a coupe at $1,835. They are to be known as model C and will be produced along with the aluminum bodied coupe and sedan which have been in production for some time at a higher price. The price of the aluminum bodies remains as before at $2,355 and $2,435. The new steel bodies are being built in the Reo shops and an option of either wood or disk wheels is offered.

A new five-passenger, two-door sedan is added to the *Stephens* line, this being priced at $2,195. The tilting front seat arrangement is used and the equipment throughout is of the sport class including drum type headlamps, a trunk with double suitcase in the rear and aluminum bars on the rear of the body.

Four Door Oakland

The new *Oakland* sedan and coupe, both Fisher built, make their debut at the show. The sedan, a four-door job, is priced at $1,445 and the coupe, which has a five-passenger seating arrangement with tilting front seat is $1,545. The coupe, which is $100 higher in price than the four-door body has considerable additional equipment, including a platform for a trunk, aluminum back rails, etc. Equipment on both the models is of the sport character.

The *Packard* line is augmented by the addition of a coupe and a five-passenger limousine-sedan to the single six chassis. The coupe has a seating arrangement for four and is priced at $3,175. All window and door glasses lower flush with the sills. The limousine-sedan is $3,275.

A new seven-passenger sedan, to be known as Model 27, fills out the *Willys-Knight* line. The price of this job is $2,195. The chassis is identical with the regular model and the fittings of the car are quite complete and of the latest sport type.

A two-door brougham is added to the *Lexington* body selections. The rear seat is quite wide and deep and has an unusually high back. The two front seats are of chair type, the right being of the tilting type. There is a trunk at the rear which contains two removable suitcases.

A new cabriolet to be known as the Commander is added to the *Liberty* closed models. The price is $1,695. The dash is finished in walnut and a walnut molding is used on the interior. The interior finish is gray with leather upholstery. The exterior finish is maroon. The equipment includes clock, cigar lighter, windshield cleaner and cowl ventilator.

THE sale of agricultural tractors in England is not likely to show any improvement in the immediate future, for of all British industries agriculture, which still remains the most important, is probably the most depressed.

In 1920 the number of British farmers who were forced into bankruptcy was but 44, in the second half of 1921 there were 171; in the first half of the current year 135 receiving orders were issued, and it is predicted that they will reach an unprecedented figure in the second half, which is always by far the heavier in this respect.

The great majority of British farmers are at the present time living on their capital, and this being the case they are less likely than ever to consider the expenditure necessary to install tractor outfits. Even in the good years immediately following the end of the war their conservatism forced them to hold back; add to this their financial stress at the present time and one sees why the prospects of tractor sales are not bright.

Prospective Prosperity in South Makes Good Automotive Market

Development on industry and diversification of crops will make South more stable market. Scientific farming methods needed. Bankers consider economic outlook bright and are ready to handle automotive paper. 10,575,000 bale cotton crop due this year.

By James Dalton

PROBABLY no section of the country can point to a greater improvement in morale in the past year than can the South. Even the bankers are almost enthusiastic over the situation and southern bankers are notoriously conservative.

Generally speaking, the impression has prevailed that the South was hit harder by the depression than other sections, but this is an illusion. Its industries suffered no more than did those in the East and Middle West and in some cases not so much. Its farmers are not starving and never have feared that they would. They are not as thrifty as those in some other districts and they had to borrow a little more from the banks.

The South as a whole is well worthy of study as an immediate market for automotive products but its cultivation as a market on a long swing basis is even more important. It is not a foreign country but part and parcel of the United States and it should be treated as such.

From a market point of view the chief difference between the South and other sections is that longer credits are asked. Even this difference is not nearly so marked as it was two years ago. The fallacy of long credits is one lesson the slump taught the South.

We have tried to point out in previous articles that the automotive market is ready at hand in the cities and towns of the South although it is more or less dormant for trucks in the rural districts. It may not be amiss to give some facts of general conditions there.

While recent years have brought a spectacular industrial development, agriculture still exerts a determining influence on sentiment. In the South agriculture still means cotton. A shoe dealer in Atlanta, for example, may not sell four pairs of shoes a year to persons connected either directly or indirectly with the growing of cotton, but if cotton prices are up he is cheerful and if they are down he is glum. This would be the case even if his sales were mounting month by month. He and his neighbors, even if profits were steadily increasing, would tell you that business was bad and shake their heads sadly. They would go right on buying motor vehicles, however.

It is a mistake to assume that there can be no business in the South if the cotton crop is not a huge success. The value of the manufactured products of the South is greater than the value of its crops. No matter what the crops may be, some automotive products always can be sold in the larger centers of population. Manufacturers who went for many months on the theory that it was impossible to sell anything in the South lost a lot of money.

Two factors will make the South less dependent in future than it is at present on cotton. They are:

Development of industry.
Diversification of crops.

There is greater room for development in the South than in other sections and consequently the prospective market is larger. In some respects it resembles the middle west of 25 or 30 years ago but the population is already there. All it needs is development and many districts now devoted almost exclusively to agriculture are rich in natural resources. These resources will be exploited in the near future.

The South always will be great in agriculture, however, and scientific farming will do marvels for it. This applies both to crop raising and crop selling. The cooperative marketing movement has gripped southern farmers and is making rapid progress.

When M. B. Wellborn, governor of the Atlanta Federal Reserve Bank, was asked what the South needed more than anything else, he replied laconically:

"Good farmers."

Amplifying this statement, he explained that much fine land which can be purchased cheaply now, is going to waste and that agricultural possibilities have not been developed to anything like a maximum. He added that any farmer intending to settle in the South should have some capital. Best results could be obtained by combining a few small farms of from 30 to 60 acres and stocking them with some good cattle. There is a good field for dairying in the South.

There also is a crying need for scientific farming. Comparatively few southern boys go to agricultural colleges. When they stay on the farms they are content to apply the methods of their fathers. It will seem almost inconceivable in other sections, but there are thousands of farmers in the South who do not even raise the grains and vegetables they need for food. The South still imports a good share of its foodstuffs. There are not

enough market gardens and dairies surrounding the larger cities to supply local needs. Many farmers devote all their land to some one money crop.

Wellborn hasn't changed his ideas about the folly of southerners buying automobiles when they can't afford them but he insists that he is not in any sense any enemy of motor vehicles. In fact considerable of his own money is invested in an automobile business. A motor car is a good thing for the farmer to have, he declared, if the farmer can afford it. A car makes him and his family happier and more contented. He believes also that most Southern banks will assist a farmer in financing the purchase of a truck or tractor if it can be shown that it will be good business to buy.

There was a look of contentment on the banker's face as he handed over a sheaf of letters from member banks reporting on general conditions in their sections. Almost without exception these reports were optimistic. It was evident these hard-headed business men were trying to exercise constraint when they told of the favorable outlook for crops, of busy factories and of decreased indebtedness.

Cash reserves in city banks are high and country banks are in good condition. Farmers won't pay all their notes this fall, but they will go far toward wiping out their obligations. All of them will keep some cash, however, and they will be in the market for the things they need most. Automobiles are in this category.

With a cotton crop estimated by the Department of Agriculture at 10,575,000 bales when the minimum needs of the world are at least a million bales greater, it is evident the crop will bring an excellent price and that growers will have more money to spend than they have had for two years. This can't fail to make prosperity for automotive merchants.

Backing up Wellborn's personal opinions, here is an extract from the latest review of conditions sent out by the Atlanta Federal Reserve Bank:

"Member banks throughout the Sixth district are distinctly optimistic in their reports regarding conditions in their localities. Only a small number of the larger city banks are borrowing from the Federal Reserve Bank and borrowing by country banks is very much less than a year ago. Some of the banks have surplus funds and deposits show a satisfactory increase over those of a year ago. Some of the reports indicate that while liquidation of last year's indebtedness has not been completed, A LARGE MAJORITY OF THE FARMERS IN SOME PARTS OF THE DISTRICT HAVE PAID UP ALL OF THEIR DEBTS AND ARE NOW BORROWING REASONABLE AMOUNTS FOR USE IN MAKING THE PRESENT CROP."

That doesn't present a very sad picture of the position of the farmer. As a matter of fact, credit conditions in the South are distinctly easier and it isn't hard to borrow money for any legitimate purpose if you have reasonable security to offer. It is significant that sales of farm implements in the Sixth Federal Reserve district increased 7.4 per cent in July as compared with June and 158.6 per cent as compared with July, 1921.

Banks in the larger cities even now are financing about 40 per cent of the time sales of motor vehicles and finance companies the remainder. The banks are glad to meet the credit needs of the able, well-established dealers. Banks also are willing to finance substantial farmers in the purchase of trucks for they are looked upon as a good investment. Much missionary work must be done, however, to induce farmers generally to buy trucks. They insist that they must have mules anyway and that it is cheaper to raise mule feed than to buy gasoline.

T. R. Preston, president of the Hamilton National Bank of Chattanooga, and one of the leading bankers of the South, as well as president of the Southern Commercial Congress, is just as optimistic as Wellborn over the future of the South. His interest, however, is more from an industrial than an agricultural angle. All of Tennessee, he says, is a good potential automotive market. The banks now have more money than they can loan to advantage.

Chattanooga is fairly typical of the larger industrial cities of the South. It is becoming a textile center and for years has had important iron industries. More boilers are made there, for example, than in any other city in the country, with one exception. Preston cited the case of T. C. Lupton, who made a fortune in a soft drink to which the entire South is addicted, and now is spending $10,000,000 for spinning mills to supply yarns for mercerized fabrics. Production of hosiery is an important industry in Chattanooga.

"CONDITIONS are far better than they were a year ago," Preston said. "Shorter credits are being asked and there is plenty of money to loan. Farmers are getting their debts paid and will keep something to buy the commodities they need. The next ten years will bring a tremendous industrial development to the South, and as I see its future it is brighter than that of any section of the country."

Birmingham, at the moment, is in a class by itself industrially. Its soft coal mines have been producing every pound of coal possible since the strike began and all its steel and iron plants have been running at capacity. The miners' unions in the South were crushed in the strike some two years ago and there have been no labor troubles in the entire territory except the shop men's strike.

The South has been hard hit, however, by the rail strike, and it has caused a sharp slowing up in business in the past few weeks because of the virtual collapse of all but one of the important Southern roads, so far as freight traffic is concerned. Lumber interests have suffered severely. In fact, shippers of all kinds of commodities have had many cancellations because of their inability to get deliveries over the railroads. Incoming merchandise also has been seriously delayed.

They will tell you in the South that the center of gravity of the steel and iron trades of America is shifting toward the rich ore, coal and fluxing stone beds of north Alabama, Georgia and Tennessee. It is reported, apparently on good authority, that the Jones & Laughlin Steel Co. is negotiating for the purchase of huge iron ore tracts south of Chattanooga and coal lands in the north. In addition, there is the regular crop of reports that Ford will buy ore and coal lands in the same district.

Within the last year title has been passed to four syndicates on 300,000 acres of iron ore land on Sand and Lookout mountains, near Chattanooga. The price amounted to more than $5,000,000. The North American Steel Corporation, resulting from the merger of the Mid-

vale, Inland and Republic companies, will manufacture on an extensive scale at Birmingham. The Great Southern Steel Corporation proposes to establish a plant at Guntersville, Tenn.

Transcending all other developments is the possibility that Ford's industrial dreams for Muscle Shoals will come true.

Railroads will follow industrial development. The Tennessee, Alabama & Georgia has decided to open up a rich untapped ore field by an extension from Gadsden to Odenville. Naturally, industrial development will bring a good market for motor trucks. They already are being used extensively by manufacturers of all kinds as well as in connection with iron and coal mining.

Another factor in the future development of the South is its wealth of developed and undeveloped hydro-electric power.

INDUSTRY presents only one side of the picture, for agriculture will keep pace with it. Diversification of crops and scientific farming have been preached so long that the missionary work is beginning to bear fruit. For example, more than 100 Mississippi planters and business men attended the pageant of progress in Chicago after a two weeks tour of the corn belt. The primary purpose of the trip was to gather information from livestock, grain and dairy farmers preparatory to the diversification of farming in their own State. They also visited several agricultural colleges.

In any consideration of agriculture in the South it must be remembered that the farm population is approximately 17,000,000, of whom only 5,000,000 are negroes. These people constitute a tremendous potential market for automotive products. Crop diversification and co-operative marketing will bring them larger and more stable earnings.

Co-operative marketing of cotton already has assumed large proportions. For example, the American Cotton Growers Exchange, with headquarters at Atlanta, represents 150,000 planters who will produce 2,500,000 bales this season. It recently authorized the opening of a European sales office in Liverpool as well as sales offices in the textile mill centers in the Southeast, such as Greenville and Spartanburg, S. C., and Greensboro and Charlotte, N. C.

The exchange has arranged for advances of $51,000,000 from the War Finance Corporation, while more than 250 banks in the Southeast have promised an equal amount to insure the profitable marketing of this year's crop. Bankers believe these co-operative agencies sound in principle financially. Members of the Cotton Growers Exchange, for example, can take their cotton to warehouses and then borrow on warehouse receipts from the banks up to 60 per cent of the current value. They get the rest of the money when the crop is marketed. Much of the cotton sold in this way goes to mills in the South.

Business is good in the South to-day, and you can't find a Southerner who wouldn't be willing to wager his last cent that it will be better a year from to-day and still better two years hence. There are many factors which favor the immediate sale of medium-priced cars. Living costs in the South are not as high as they are in some sections and the man with an income of $3,000 a year can well afford to have one. The service given by traction lines generally is atrocious, and an automobile is almost a necessity.

If the automotive industry doesn't get its full share of present and prospective prosperity it will be its own fault. All the market needs is a reasonable amount of cultivation. The soil is rich.

Motor Cars and Trucks in Successful Operation on German Railways

SUCCESSFUL operation of motor cars and trucks on German railways has aroused the interest of the American automotive industry. The Automotive Division of the Department of Commerce received many inquiries asking for details concerning the equipment used by the Germans. A detailed description received from C. E. Herring, the American Commercial Attache at Berlin, gives a comprehensive outline of the rail car situation in Germany.

The following types of motor cars and trucks are operated on the Federal German railways:

(a) Accumulator-Driven Cars (Speichertriebwagen) one, two and three parts. These are passenger cars, which derive the necessary current for the motors from an accumulator battery fixed in the car. They are capable of running 180 kilometres at a speed of 60 kilometers an hour. They are only employed for carrying passengers and luggage.

(b) Benzol-Electric Cars (Benzolelektrische Triebwagen)—passenger cars, fitted with a benzol motor, coupled directly with a continuous current generator. This continuous current generator furnishes the current for the axle motors under switch control. Speed 60 kilometers per hour. They are used also for passenger and luggage carrying.

(c). Cars Driven Directly by Benzol Motors. They are light railway passenger cars, fitted with benzol motors, which, by intermediate switching of speed and worm, drives controlled by compressed air, rotate the axles directly. Speed 60 kilometers an hour, and passenger and luggage carrying.

(d) Automobiles running on railway tracks are employed for service runs. They are similar to passenger automobiles, but have wheels with flanges. They are used on normal-gauge railways.

(e) So-called motor velocipedes (Motordraisimen) are used for service runs. They are light four-wheeled, two-seater cars, propelled like motor-cycles by one or two-cylinder motors. Maximum speed 30 kilometers an hour, and capable of carrying 4 to 5 persons.

There are no freight-carrying vehicles on German railways of the types described above.

Comparative Tests of Fuels Produce Interesting Results

Less volatile fuels show about the same economy as the more volatile grades where carbureter is given best setting in each case, but relative performance in cold weather has not yet been determined. Tests show more dilution of lubricant with less volatile fuels.

By Herbert Chase

FUELS of higher average boiling point than are now commonly marketed appear to yield about the same ton miles per gallon as more volatile fuels, providing the carbureter is given an equally good setting in each case. This applies to relatively warm weather operating conditions. The effect of cold weather on the relative economy of volatile and non-volatile grades is yet to be investigated.

Tests made thus far indicate that more dilution of lubricant occurs with the less volatile fuels but further investigations along this line are needed before final conclusions are to be drawn.

These, in short, are the findings to date in comparative fuel tests arranged through joint action of the Society of Automotive Engineers, the National Automobile Chamber of Commerce and the American Petroleum Institute. A preliminary report in this connection was made at a joint meeting of committees representing these three organizations held last week at the Bureau of Standards in Washington.

It will be recalled that the first preliminary report covering tests arranged by the joint committee in question was made at the last summer meeting of the S.A.E. at White Sulphur Springs and that the results reported at that time referred to tests made on a fleet of Post Office Department trucks operated in Philadelphia and Pittsburgh. The findings in that case were substantially identical with those recorded in more recent tests made under more definitely controlled conditions by investigators on the Bureau of Standards staff.

The recent tests were made on a level stretch of road forming apart of the Washington Speedway along the Potomac River. This course was marked off in divisions one-tenth mile in length. Each division was covered at a predetermined speed which was held as nearly constant as possible over each division. For example, one-tenth mile was run at 15 m.p.h., another at 25, the next at 10, a fourth at 30 m.p.h., etc., thus involving accelerations and decelerations. In accelerating the throttle was opened wide immediately and then closed the necessary amount to maintain the desired speed once that speed was attained. Decelerations were made by closing the throttle quickly but without applying brakes. The fuel used during each tenth mile was measured carefully by using graduated burettes arranged in parallel and connected through quick acting pinch valves to a common fuel line. These were all filled to the top mark before starting. The first burette was opened at the start and closed at the end of the first tenth mile, the second at beginning and end of the second tenth mile, etc., to the end of the course. Time for each tenth mile was noted by use of stop watch with split second hand.

At the end of the course the decrease in quantity of fuel in each burette was noted, this quantity being that used during the corresponding tenth mile. The driver was guided as to speed by markings on the tenth mile posts and the observers changed burette cocks and operated the stop watch on passing the posts.

The fuels used were designated A, B, C and D, and had distillation curves which varied from that of a quite volatile fuel such as was generally marketed several years ago, grade A, to that of a fuel which is now thought to be about the least volatile which can be used in the average automotive engine of to-day, grade D. Grade B corresponds closely to the average gasoline now marketed in the country and is used as the standard or reference fuel, while grade C is intermediate between B and D.

In all tests made to date each of the four fuels has been employed successively. In the speedway tests which have already been completed on Ford and Dodge cars and are to be made soon on a Chevrolet four and Buick six. A standard carbureter setting made with fuel B is first tried. This setting is one which has been found to enable the car to climb most rapidly a certain test hill after repeated tests with numerous settings varying from over lean to over rich. It is thus a maximum power setting or one slightly on the lean side of the maximum power setting, and has been found to be the leanest setting which can be employed and still give rapid acceleration without back firing when the throttle is suddenly opened with the car running on a level road.

AFTER this standard setting with B fuel speedway runs are made with the same carbureter setting successively on A, B, C and D grades and results noted. These runs show, in general, a considerable variation in miles per gallon. Further tests are then made using an optimum setting for the particular fuel obtained in a hill test identical with that used in obtaining the first standard setting on B fuel. With this optimum setting in each case the variation in miles per gallon has thus far proved practically negligible—well within the limits of experimental error.

Much the same condition was found in the Post Office truck tests already referred to, and in a series of tests made by several of the large car manufacturers, the results of which have not yet been published.

The simple conclusion is that, providing the carbure-

ter is set to best advantage in each case, the distance the car will travel per gallon of fuel is, within the range of fuels tried, practically independent of the volatility of the fuel. This condition was not generally expected, at least by a considerable number of those connected with the tests.

The meeting at the Bureau was called to discuss the results obtained to date and to decide upon further tests which appear to be desirable.

There was, on the whole, but little criticism of the methods thus far followed or of the results obtained, but it was quite generally agreed that further tests, especially under the lower temperature conditions which prevail in northern states during the winter months, should be undertaken, and that in further tests such factors as ease of starting, ability to handle well under conditions of changing load and speed and extent of dilution of lubricant by fuel should be given careful consideration.

Certain tests covering factors of this kind have already been made or are included in the schedule already tentatively decided upon. The extent of fuel dilution of lubricants has been observed in some of the tests now completed, and factors involving the handling of cars under load and speed change have been noted, to a certain extent, in the speedway tests and in the tests of cars by various factory organizations, but there is more to be done in this direction, especially under lower temperature conditions than have obtained during tests thus far completed.

The tentative schedule of future tests includes, besides completion of tests on the Speedway, longer runs with the same cars operating over rolling country between Washington and Frederick for the purpose of determining the quantity of dilution resulting from the four fuels, and also tests for determining starting characteristics to be made in the altitude chamber at the Bureau where the desired temperature can be maintained by artificial means.

It was suggested that Speedway tests now made at a series of varying speeds might be extended to include tests at certain constant speeds in order to determine whether the speed for maximum economy is the same for all of the four fuels under consideration. There was also some discussion as to the desirability of runs with the leanest feasible mixture, some contending that the more volatile fuels, while showing little advantage over the less volatile ones on a ton mile per gallon basis with a maximum power setting, might well prove superior on a maximum economy basis. In this connection it was pointed out that the setting used already was about the leanest possible for good acceleration with the throttle suddenly opened, but it was not clear that a leaner mixture could not have been used, still with good acceleration, had a more gradual throttle opening such as is used under most circumstances in normal practice been employed.

Another suggestion was to the effect that runs be made with the carbureter settings made by an average service man, in order to determine how nearly correct such an average setting is and how such setting will be affected by the volatility of the fuel. O. E. Berry contended that a mile per gallon test alone is not of much value unless it is coupled with a general performance test which shows how the car handles under variations of load and speed such as are encountered in normal service. Others took the view that, while such tests are desirable from an educational standpoint, they are not essential as a means for comparing fuels.

In reply to a question concerning the effect of spark advance a member of the Bureau staff pointed out that, for a given quality of mixture and spark position, it had been found that the best timing of the spark is the same for all fuels.

It was agreed, and especially emphasized by the men from the oil industry, that the fuel characteristics which determine ease of starting are of great importance. In this connection various speakers mentioned the desirability of measuring with care the quantity of fuel used in starting and the time required to warm the engine after starting until the temperature is high enough to pull a load steadily without missing. It is desirable to learn also whether the initial or the average boiling point of the fuel is the more important as affecting starting ability.

FACTORS pertaining to dilution of lubricant in the crankcase by fuel which has passed the pistons were considered at length. The tests in which measurements of dilution have been made to date indicate that it increases as the fuel becomes less volatile but it is not known how far dilution can proceed without causing undue wear. The best method to use in determining the extent of dilution is also in doubt. Change in oil viscosity is probably a satisfactory index of dilution, but tests which depend upon fractionation may lead to erroneous results due to cracking of the lubricant in the still into lighter fractions, which are then improperly considered as fuel diluent.

Oil dilution is a well recognized evil and is believed to become increasingly pronounced as the fuel used becomes less volatile. It is believed to lead to rapid wear, but how severe the action becomes with loss in viscosity is uncertain. Low temperatures and often repeated or difficult starting may greatly increase the quantity of fuel which passes the pistons. Consequently cold weather tests are needed in arriving at test results of proper significance.

H. L. Horning expressed the view that the serious trouble attributed to dilution is due to the change it makes in oil viscosity. The more viscous oils leave thicker films on cylinder walls and decrease wear. Dilution tends to make the oil less viscous and the films thinner and consequently increases wear, ultimately causing complete failure of lubrication. Horning believes that the per cent of oil dilution is of secondary importance, but the viscosity of the diluted oil is of great moment.

Many further tests dealing with fuel diluton of lubricant are proposed, especially in cold weather, but the drafting of a definite program covering this and other work considered desirable was left to a sub-committee to be appointed in the near future.

New Import Duties on Trucks into Angola

THE Provincial Government of Angola, Portuguese E. Africa, has recently established the following import duties on trucks:

Trucks weighing:	Escudos Each
Less than 1 metric ton each and equipped with pneumatic tires	50.00
From 1 to 2 tons, with pneumatic or solid tires	500.00
From 2 to 3 tons, with pneumatic or solid tires	1,000.00
Over 3 tons with pneumatic tires	2,500.00
Same with solid tires	5,000.00

Duties on most products imported into Angola vary from 19 to 33 per cent ad valorem according to port of entry.

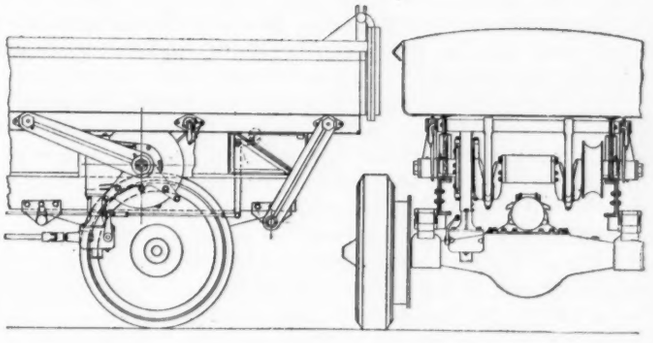
A Combined Mechanical Hoist and Winch for Trucks

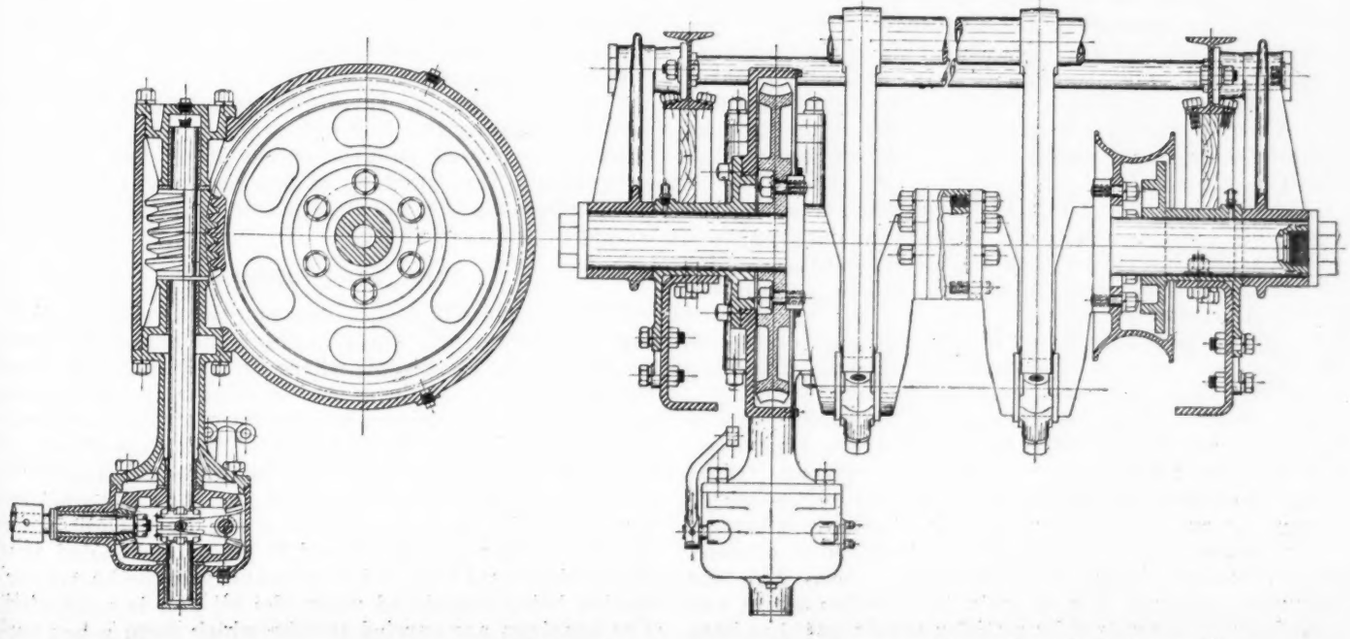
Is intended for use with dumping type of bodies or on trucks employed in service requiring power loading, hoisting and the like. Cranked shaft driven by worm and bevel gearing is provided with capstan and can be rotated in either direction by power take-off.

AMONG the useful items of equipment for motor trucks are those intended to provide quick loading and unloading facilities. For certain classes of work winches are great labor and time saving devices and dumping hoists are also widely used for trucks carrying coal, building materials and the like. A device known as the Pyramid Mechanical Hoist-Winch, which combines these two functions, has recently been placed on the market by the Pyramid Engineering Corp.

This device consists primarily of a cranked shaft operated through worm and bevel gears from a shaft connected to the power take-off of the gearest. The cranked shaft is mounted transversely on the frame of the truck chassis just forward of the rear axle. On each end of this shaft is a heavy arm the outer end of which is pivoted to the body in such a way as to raise the forward end of the latter as it moves toward the rear. At the same time connecting rods attached to the cranked portions of the shaft displace the body toward the rear in such a way that its center of gravity describes a rather flat arc and the load is therefore lifted through a short distance only thereby minimizing the power required and lessening the stresses on the mechanism.

When it is desired to use the device as a capstan, the wrist shaft pins, which are provided with handles are removed. This permits the wrist shaft to slide in the I-beams which form a part of the body structure as the capstan pulley, which is rigidly mounted on the cranked shaft, rotates. A rope passed once or twice around the capstan and the free end held taut by the operator can be made to do a variety of operations, such as loading or hoisting heavy machinery or even pulling the truck on which the winch is mounted out of the mud. A block and falls can, of course be employed if desired. The hoist can be operated in either forward or reverse direction and is self locking.





Views of the Pyramid Mechanical Winch-Hoist showing details of construction and method of mounting

Trend Toward Greater Stiffness in Crankcase Design

Better disposition of metal and greater attention to ribbing tends to counteract the bad effect of stresses imposed by frame warpage without material increase in weight. Periodic vibrations are also eliminated or rendered less apparent.

By J. Edward Schipper

ONE notable trend in recent engine design has been that toward the use of stiffer crankcases. Although unit loads on bearings have decreased, due to the increased diameter of the crankshaft of modern engines, as well as longer bearings, the bearing supporting structure has been increased in rigidity until now a great many crankcases are as much as 400 or 500 per cent stiffer than in similar engines of three or four years ago. The demand for structural stiffness has affected the design of many chassis parts. Much stiffer frames have been made during the past few years, and all engineers are familiar with the increased rigidity in crankshafts.

The stiffer frame has come about through the demand from car users for bodies which will remain in good condition after years of service, and which will not warp or become racked when the car, for instance, rests on an incline with one wheel higher than the other three.

The stiffer crankshaft has, of course, resulted from the use of higher speed engines and the demand for less vibration, while the stiffer crankcase has been developed as a result of the same causes which have rendered necessary the stiffening of the frame and the crankshaft. It is well recognized that even with three-point suspension, certain of the stresses, due to weaving of the frame, are transmitted to the crankcase. This is true because, although the crankcase support is theoretically at three points, it is in practice not really a three-point suspension because there is considerable area of contact as distinct from the theoretical point contact with which there is no area.

Although it is a fact that the three-point mounting, as commonly used, decreases the stresses on the crankcase to a considerable extent, they are, nevertheless, not altogether eliminated and distortion of an improperly stiffened crankcase is not only possible, but is known to actually occur. Distortion of the crankcase tends to destroy the bearings, consequently causing bind and wear, and sometimes, even crankshaft distortion.

Higher rotative speeds have called for care in engine balancing which was never necessary at the time when engines developed maximum power at 1400 r.p.m., or at least well below the 2000 r.p.m. mark. As engine speeds began to mount and critical periods of vibration became very evident at certain speeds, the benefits of a really rigid crankcase began to be realized. More than one apparently chronic case of periodic vibration which was modified to some extent by a stiffer crankshaft, has been practically removed by the use of the stiffer crankcase.

There are some interesting problems of sound vibrations which are mixed up with crankcase construction. An example of this may be pointed out in connection with the redesigned Oakland crankcase. Fig. 1 shows this crankcase, which is marked to indicate the various points which the Oakland Motor Car Co. has reinforced. The rib at A was added, while at B the web was carried across the corner formerly being shown as indicated by dotted line. The rear main bearing wall ribs shown at C and D formerly tapered back so that they became tangent to the wall at the top, but as will be noted from the drawing, they are now carried straight upward.

On the front main bearing wall, this was also the case except that the rib stands only half way up. It was found by the Oakland company in making laboratory tests that a rib in this position produced a drumming sound. By the use of two ribs instead of one and by carrying them practically parallel to the top of the crankcase or as far upward as possible, material strength was gained. The ribs shown at F are on the bottom face of the crankcase and join the ribs to the side walls to the rear main bearing wall. This formerly was as shown in the dotted line. The effect of all of the stiffness at the rear end tended to eliminate the deflection existing due to the over-hang of the gearset and clutch bell housing.

Ribs at G and H are reinforcements added to take care of handling the castings, since it was found that fractures occurred particularly at H on this account. According to the engineers of this company, it is practically impossible to make a crankcase too stiff from a performance point of view.

Obtaining Stiffness

The example which has been pointed out by the Oakland company is only one of a great number of instances which can be given of where the ribbing has been changed to gain stiffness and eliminate the drumming sound due to a membranous structure of the crankcase. An examination of the drawing of this case shown in Fig. 1 shows a good example of the proper ribbing methods to fully take up bearing stresses. Another good example of ribbing is that used in the light eight Oldsmobile crankcase, Figs. 2 and 3. It will be noted that this is the latest type of barrel crankcase, the barrel formation being completed when the oil pan is connected. The bearings are carried in ribs which form a box section, which is the strongest section to withstand the

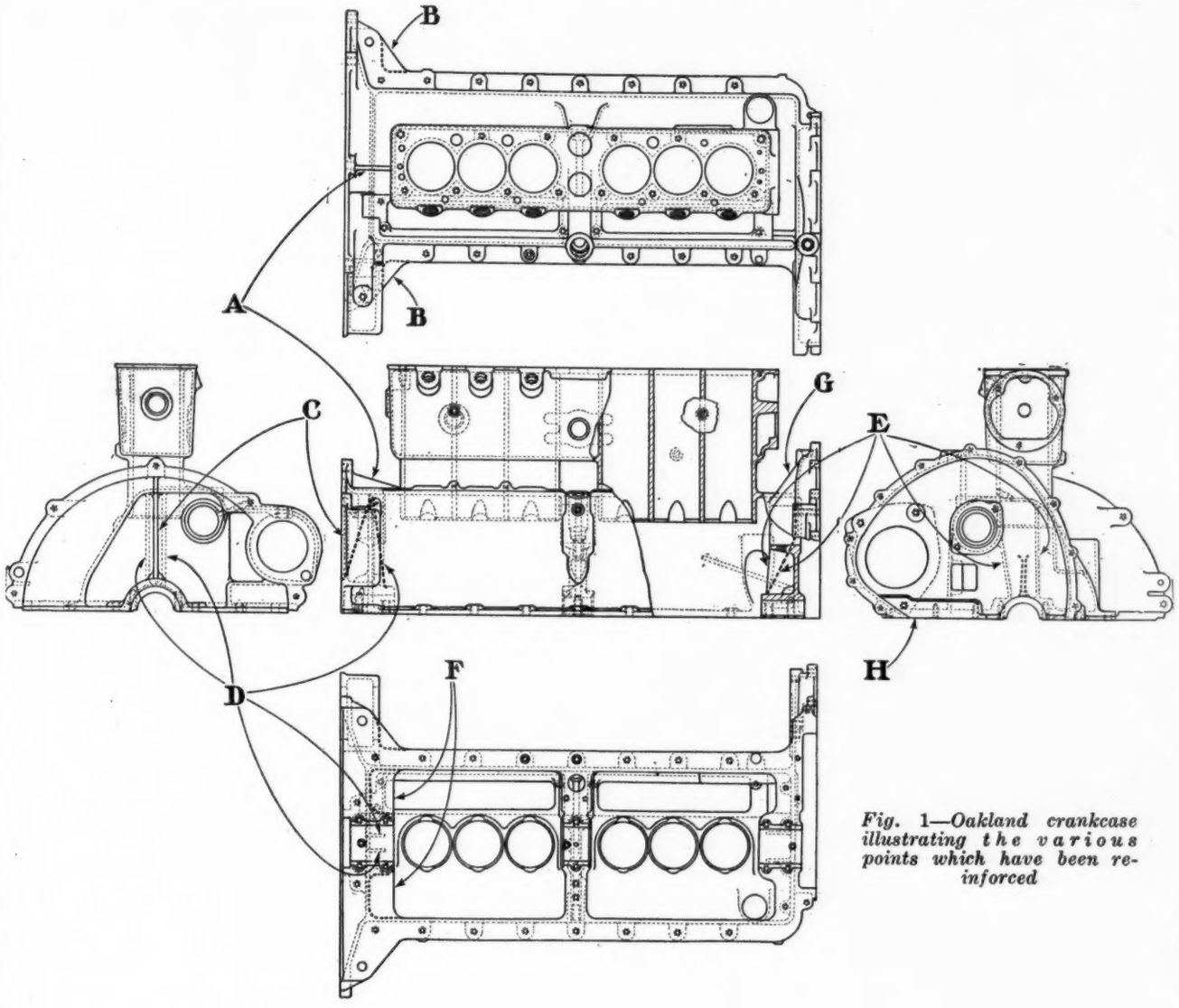


Fig. 1—Oakland crankcase illustrating the various points which have been reinforced

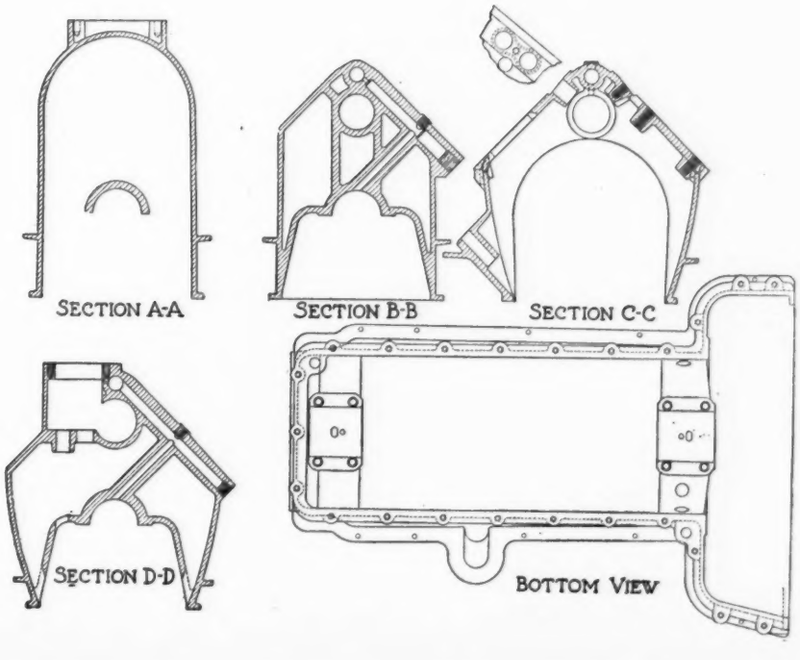


Fig. 2—Latest type of barrel crankcase used on light eight Oldsmobile

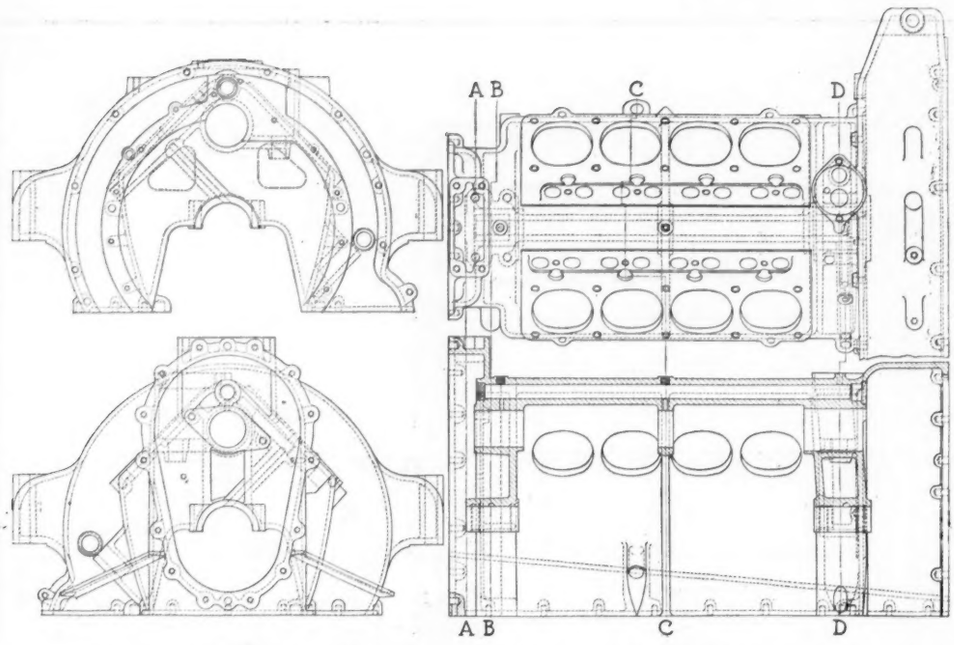


Fig. 3—Oldsmobile bearings are carried in ribs which form a box section

stresses imposed on these bearings. The camshaft is also carried in box section ribs. The oil ways are also so arranged as to form additional backbone and entirely eliminate the use of separate oil pipes which are always objectionable. This type of crankcase is adaptable to engines of any number of cylinders. The short overall length is a factor in securing longitudinal rigidity.

Regarding the question of bearing supports and ribbing for this purpose, E. A. Johnston, chief engineer of the International Harvester Co., states that he has always held to the belief that the bearings should be substantially enough supported to keep the crankshaft in alignment, rather than using a weak crankcase and depending upon the crankshaft to hold the bearings in alignment. While it may be quite evident that it would be far more desirable for the crankshaft bearing to support the shaft than for the shaft to support the bearing, there have been a great number of instances where the shaft was considerably more rigid than the bearing supporting surfaces after the shaft had been stiffened to meet the requirements for the higher rotative speeds. In other words, for a considerable length of time, the development in stiffer crankshafts outstripped the development of more rigid crankshaft supports.

It might be anticipated that a limit would soon be reached in rigidity because of the additional weight of the crankcase, but practical experience has shown that although it is, of course, desirable to keep the weight down to the minimum, especially for automobile installations, no one has really found that the small additional weight necessary to properly stiffen the crankcase is objectionable. For tractor and truck installations, rigidity is even more important and weight is correspondingly less important, so that an engineer is justified in going to an even greater extent in this field than in the passenger car field. Even in the latter, however, 25 to 50 lb. could not be expended more advantageously if it would make a rigid crankcase out of a weak one. However, it is rarely necessary to add so much weight if the material in the crankcase is properly disposed to meet the stresses imposed. Figs. 2 and 3 which illustrate the crankcase used in the light eight Oldsmobile show clearly the box-like support for the bearings in this car. The drawings also show the advantage which is taken of the material necessary for the drilled oil leads to add structural strength to the crankcase.

One of the concerns which has been noted for a great many years for the rigidity of its crankcase is the Locomobile Co. For years this concern has been the only company in the business which has used a bronze crankcase, not only for its greater stiffness, but for its greater strength and freedom from distortion in service. This concern has recently undertaken the development of a new engine with an aluminum case. In order to make this case just as stiff as the bronze case, they state that it has been necessary to make the section of the upper half of the case very deep and to split the case well below the main bearing section. In the bronze crankcase, which the Locomobile company is now using and which is shown in Fig. 4, the engine oil pan is considered as part of the reinforcement of the case. The Locomobile crankcase shown in Fig. 5 shows the upper half of the aluminum crankcase proper. This has just passed the design stage and is not as yet in production, being purely experimental. In this case, it will be noted, the oil pan is merely an auxiliary and the upper half of the crankcase is amply stiff to keep the bearings in line and free from distortion. According to the engineers of this company, one of the facts which has been brought home to them in their studies of crankcase design is that it is essential that the brass liners of the main bearings as well as the connecting rods, be very heavy in order to prevent breathing of the bearing boxes in service. This breathing effect has a tendency to distort the bearing out-of-round once every revolution of the crankshaft and results in the cracking of and breaking down of the bearing surfaces. It has also been found that to further prevent this condition it is desirable to heavily reinforce the main bearing caps and rod caps.

A point of importance in relation to production is the suggestion that the webs which traverse the crankcase and carry the main bearings of hollow box section, should be smooth on the outside. This enables the scrapers who have to clean out the inside of the aluminum crankcase, to do the work very easily. In fact, on an aluminum crankcase of any design, it is desirable to avoid internal ribbing on the surfaces exposed to the oil. As far as possible these surfaces should be made smooth and to conceal the ribbing, either in the box section or on the outside of the case. Experience shows that in order to get all of the foundry sand out of the aluminum casting it must be scraped by hand. No other method, it is believed, is quite as satisfactory and the scraping is essential to long life of the engine.

This point, which is brought up by Locomobile engineers, is important. It is the practice in some very good engine plants when iron cases are used, to first thoroughly clean out the crankcase and then to coat the inside with a crankcase sealer in the form of a paint which takes on a sort of celluloid texture after it dries. This paint firmly cements any loose pieces of core sand or chips in the case, preventing them from afterwards working their way into bearings, etc.

A point which may be noted in the illustrations shown herewith is that there is an undoubted tendency towards separating the crankcase well below the center line, thereby adding to the stiffness of the case, even though it is done at the expense of added machining cost. A great many engineers have been led to believe that by casting the upper half of the crankcase in unit with the cylinder block, it would be possible to lighten the crankcase and take advantage of the cylinder block stiffness. This has not worked out as satisfactorily as would appear on the surface.

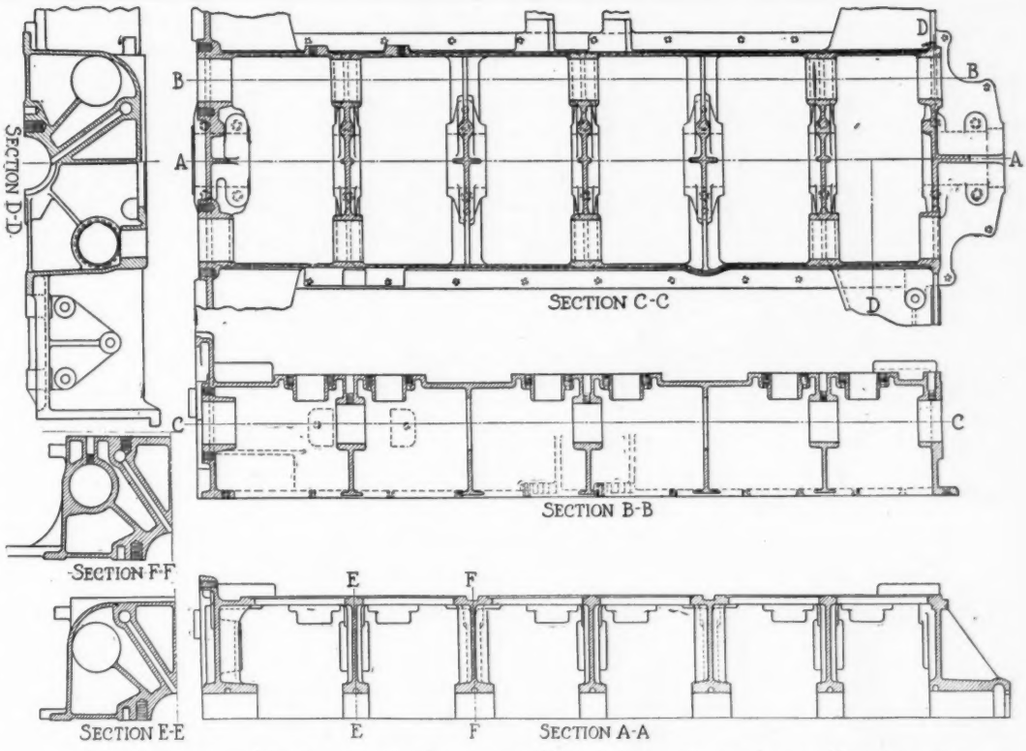


Fig. 4—Locomobile bronze crankcase in which engine oil pan is considered part of reinforcement

One of the new six-cylinder engines which illustrates up-to-date practice in crankcase design and also brings out clearly some of the tendencies which have been mentioned is that used in the Jordan-Continental engine. This case is illustrated in Fig. 6. It will be noted that this crankcase is not split on the center line of the main bearing. This makes it possible to obtain a much better support for the gearset housing and also to give an additional support to the bearings themselves, as well as to provide a stiffer crankcase. The case is also stronger in the vertical section. This case is made just as strong as possible without running too heavily into weight and, therefore, a good example of just about how far it is desirable to go in the weight matter in passenger car design.

When the first experimental engines of this make were built the number of ribs in the crankcase were increased until the fifth one, which was so heavy as to be out of the question for production was tried. As a matter of fact, this extremely heavy crankcase made the best engine of the entire group, but it was entirely too heavy for passenger car use. The crankcase illustrated in Fig. 6 was finally selected as a happy medium, giving sufficient rigidity without too much weight. It will be noted in this case that there are no flat side walls. In the opinion of Jordan engineers, there is no question but that flat side walls should be avoided as much as possible, because any flat surface, unless properly ribbed and braced, will tend to pick up vibration and accentuate it. There is no doubt but that vibrations which do not originate in the crankcase itself or immediately adjacent, are transmitted to the crankcase and accentuated through it as a sort of sounding board. The question of resonance is nowhere so important as it is in the crankcase because of the sounding board effect which may be secured through any large, flat, unribbed surface.

Summing up the matter of crankcase design with the various angles of rigidity and freedom from resonance in mind, probably the most important fact is that the crankcase should be able to stand alone from a structural standpoint. In other words, it is a mistake to allow the crankcase to depend upon the cylinder block to any extent for rigidity. One engineer, who is in charge of design for one of the largest producers in the industry, recently said "our case is not particularly deep in section and we have to depend to a considerable extent for rigidity upon the cylinder block which is bolted to it. In view of past experience, no doubt, if we were designing this motor anew, we would endeavor to get a deeper section crankcase." From this it is quite apparent that at the time this case was designed, about 4 years ago, it was not considered so important to have the crankcase as rigid as is now known to be desirable. The crankcase should be of independent, rigid structure, fully capable of performing the work which it is supposed to do without leaning upon other members for structural support.

Like all other rules, however, the above may have its exception, where the cylinder block is particularly designed to function as an integrally cast crankcase stiffener. Speaking generally, however, engineers will probably agree that the crankcase should stand alone.

The Moline Plow Co., manufacturers of the Stephens car, uses a semi-barrel type of crankcase integral with the cylinder block. This block, in other words, is designed to contribute toward the stiffness of the case. The engineers of this concern claim that this feature, together with a heavy main bearing support, provides means of bearing support which has given them no trouble and, in fact, exceptionally long bearing life. A large part of the credit of this is given to three-point suspension. This concern states that from time to time it has experimented with four-point suspension, the front end of the engine being held with a cross-arm forging, and in each case the frame distortion has been transferred into the engine to such an extent that it was almost impossible in extreme cases to turn the engine over with a hand crank. The Moline crankcase is illustrated in Fig. 7. An interesting feature which is shown in this illustration is that the crankcase interior is ribbed longitudinally.

Another concern which relies to some extent on the cylinder block for the rigidity of the crankcase is the

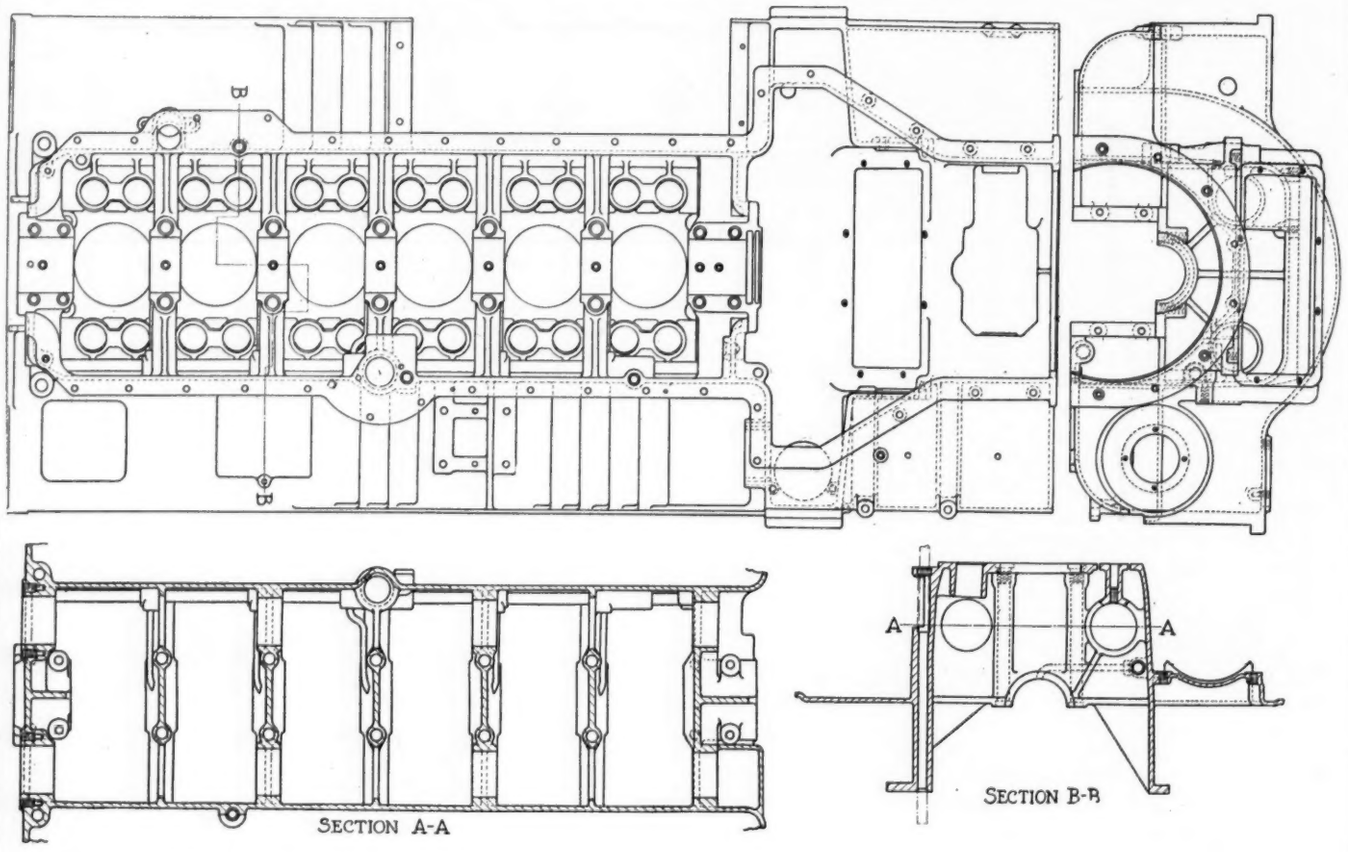


Fig. 5 (above) — Experimental type of aluminum crankcase designed by Locomobile company

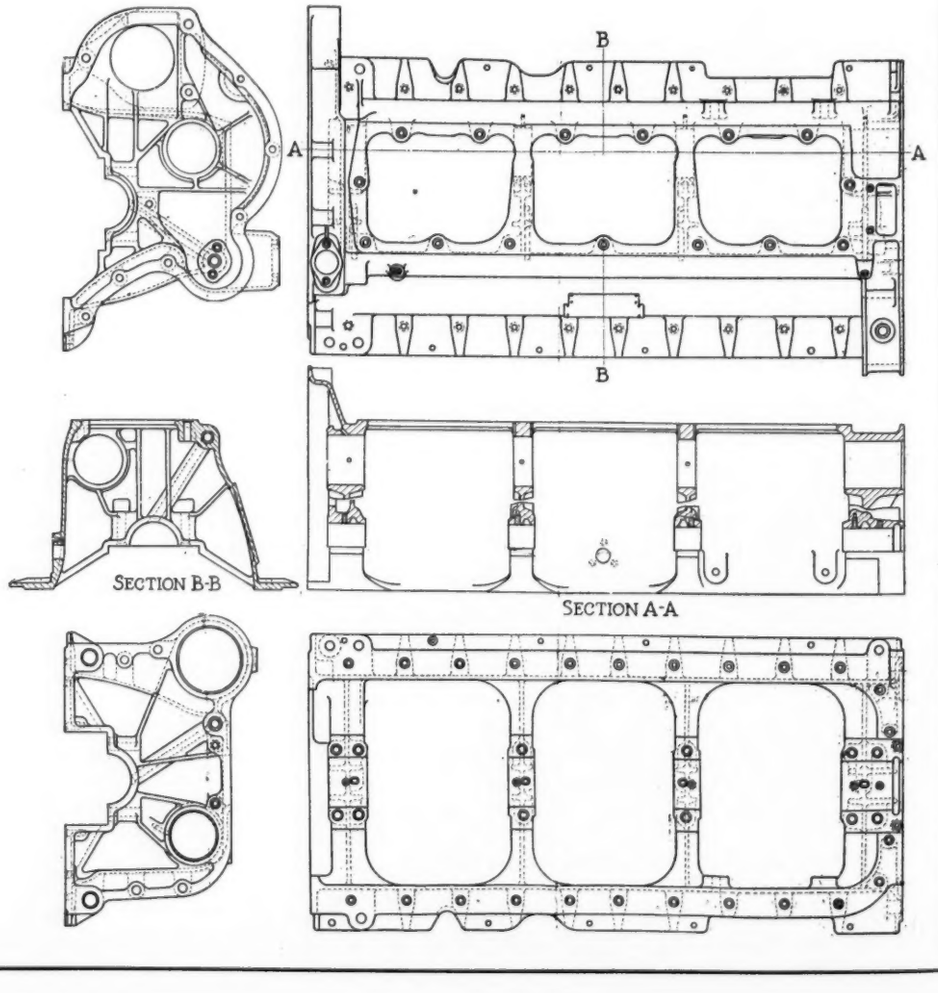
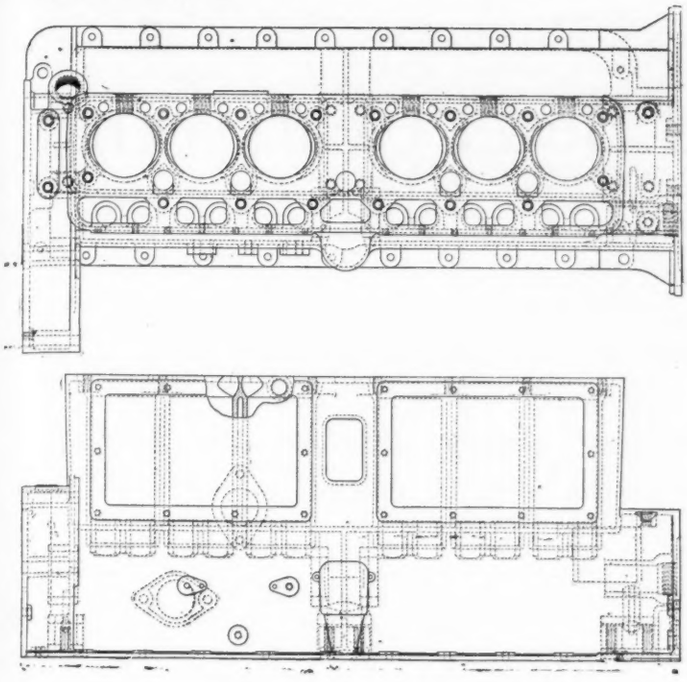


Fig. 6 (right) — Crankcase used on Jordan Continental engine. Note that the case is divided well below the center line of the main bearings



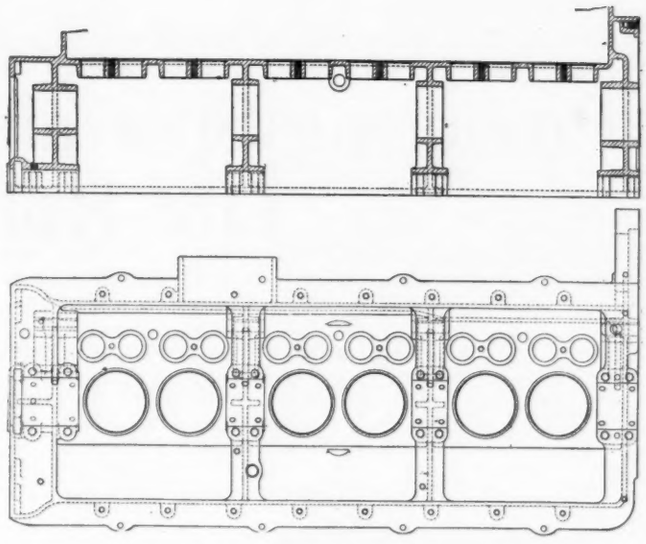


Fig. 7 (right)—The Moline crankcase showing the system of longitudinal ribs
Fig. 8 (left)—Liberty crankcase showing how a cylinder block which is integral helps to increase rigidity of the case

Liberty Motor Car Co. As shown in Fig. 8, this design takes care of rigidity by the use of the integral cylinder block and crankcase. This is a four-bearing case and rigidity is assisted by the use of four studs to hold the bearing cap on each main bearing. It is claimed by this concern that the use of two studs does not contribute nearly so much to the stiffness of the case as four and with this number there is greater certainty of maintaining crankshaft alignment.

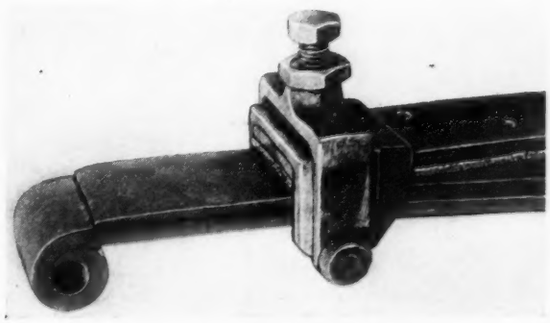
As far as the material is concerned, whether it is aluminum or iron, the strength is only one consideration. The disposition of the material is of far greater importance than its actual inherent rigidity. The proper arrangement of the internal ribbing, not only for bearing supports, but also to break up flat surfaces, is the most essential factor. It is, of course, much more simple to have a multi-bearing crankcase rigid than it is for one which has two or three bearings. In a seven-bearing crankshaft there are five intermediate ribs or webs supporting the bearing, which also acts as a structural member for the stiffness of the case itself. The Dorris Motor Car Co. states that these reasons are responsible for their concern going to seven-bearing crankshafts in 1915. At certain critical speeds there was a period which they traced to lack of crankshaft support and to longitudinal and torsional vibration. This concern found that the use of a seven-bearing shaft eliminated this trouble.

A New Spring-Damping Device

LEMOINE, the leading spring maker of France, has placed on the market a shock absorber which forms an integral part of the spring. On a six-leaf spring, leaf No. 5, normally the next shortest leaf, is cut short and the portion removed is replaced by a Ferodo strip as far as the extremity of leaf No. 3. This strip of Ferodo is riveted to leaf No. 6, which is thinner than all the others and is equal in length to leaf No. 3.

A U-clip is riveted to the extremity of leaf No. 6, and over it is placed a second U-clip, which is not riveted, but is fitted with a cross bolt. In the space between the bottom of the two clips there is fitted a short leaf spring equal in length to the width of the main leaves, while a setscrew with a lock nut passes through the bottom of the outer clip and bears against the inner clip, thus providing means for varying the pressure on the brake lining.

In addition to damping rebound, the Lemoine device makes it possible to vary the flexibility of the spring considered as a whole. With the adjusting screw right home, the leaves are solidly clipped together, and as this screw is released the movement of the leaves becomes freer. Manufacturers who have used the Lemoine device report that it is effective.



Lemoine spring damping device

Producing Spur and Bevel Gears With Hot-Rolled Teeth

A description of the machines used and the methods followed in manufacturing hot-rolled gears. Teeth are said to be more accurate and considerably stronger than cut teeth. Herringbone type of bevel gear among the varieties made by this process.

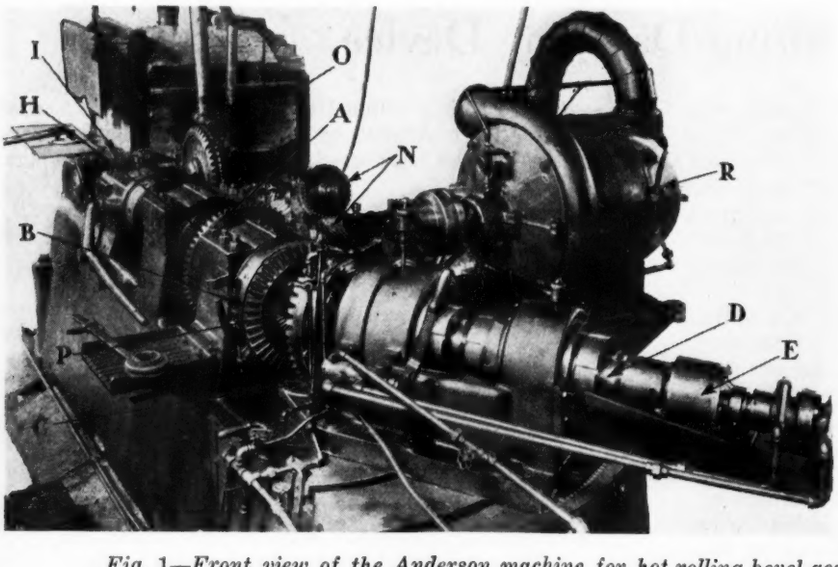
EVER since the first use of toothed gearing there has been a demand for more and more accuracy in gear forming. Silence and life, the two great requirements in gears, are both materially increased by accuracy in the tooth form. Consequently, any developments which secure greater accuracy are of interest to manufacturers in the automobile field where the requirements for silence and life are probably greater than in any other.

One of the most interesting developments of recent years in gear forming is the method now in use by the Anderson Rolled Gear Co. As the name of the concern indicates, the gears are rolled instead of cut in the blanks. This concern claims that when teeth are cut from blanks in gear-cutting machines, certain inherent defects are found. When the teeth are cut from the blank in one operation the wear on the cutter is said to be so excessive that it is difficult to maintain the cutting edges, and when the teeth are cut in two operations, double the amount of equipment is necessary and there are many delays incident to the double set-up.

For a great many years experiments have been made with the idea of forming the gear teeth by rolling a plastic gear blank in mesh with a rigid, accurately formed master gear. As early as 1872 John Conley attempted to roll teeth in gear blanks, heated, to render them plastic, by a knurling process. A number of other unsuccessful attempts to do the same were made at later dates. In all of these experiments only one of the functioning shafts, either the blank shaft or the die shaft, was positively driven, the other shaft being driven through the die and blank and the resulting gears were deformed and inaccurately spaced.

The latest endeavor to so form gears has met with success and is now in productive use by some of the largest automobile concerns. It is the invention of H. N. Anderson, who has developed the fundamental idea of positively driving both functioning shafts through timing gears separate from the blank and die and held continually in full mesh. These constrain the forming gear or die and the plastic blank to roll on one another in positive synchronized contact, without transmitting any driving power, thus eliminating slippage and tooth distortion, which are said to account for failures of the earlier attempts.

The first successful gear rolling machine embodying this idea was built during 1910, the inventor being awarded the John Scott legacy medal by the Franklin



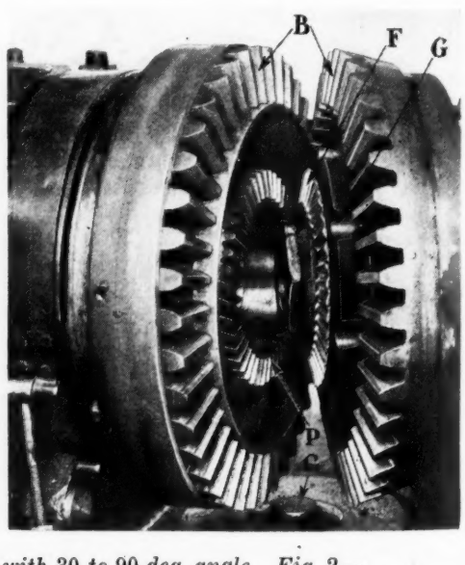


Fig. 1—Front view of the Anderson machine for hot rolling bevel gears with 30 to 90 deg. angle. Fig. 2—Detail of same machine showing timing gears, die, rolled blank and blank holder

Institute in 1915. Since this time the idea has been developed until recently a line of three machines covering a wide range of spur and bevel gears has been completed. These machines finish the teeth completely in one operation, leaving only the cleaning up of the diameters, backfaces, etc., by the customary automatic machine operations. The teeth are formed by the molding-generating action of a hardened, accurately ground, master gear die that leaves the tooth surfaces highly polished and free from scale. These hot-rolled teeth are claimed to be superior to the cut form in finish, accuracy and wearing qualities.

These gear rolling or forging machines, as illustrated by the bevel gear machine in the photographs, are built with the rigidity and strength necessary to withstand the forging strains without the deflection of any part, and also with the precise accuracy of the best modern machine tools. The elements of the mechanism of all three machines consist of two quills mounted in heavy roller bearings on a very rigid bed. One of these quills receives the driving power from the motor through a pair of bevel gears, shown at "A" in the photograph, Fig. 1, and transmits it through heavy and correctly formed timing gears, B, (Figs. 1 and 2) to the other quill.

Means are provided for adjusting the timing gears in mesh, so that there is no back-lash between them. In the two bevel gear machines, one quill can be swung around the pitch cone center, C, for various gear settings, the angular adjustment of the two machines overlapping to provide for the full range of from 0 deg. to 90 deg. A blank shaft D is slidably mounted in one quill and is keyed to it.

A pneumatic or hydraulic cylinder E is mounted on the end of this shaft and actuates a piston extending through the shaft to positively clamp the gear blank F in a blank-holder G, Fig. 2, on the other end of the shaft. Means are provided for adjusting this blank shaft endwise in its quill to accommodate different thicknesses of blanks and blank-holders.

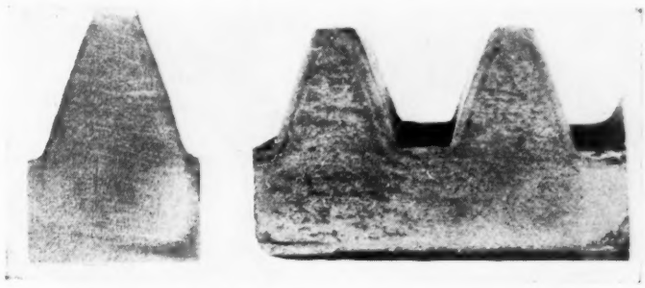
A die shaft H is slidably mounted in the other quill and is keyed to it. Means are provided for adjusting this shaft endwise in its quill to accommodate various thicknesses of dies. A cam and roller I, Fig. 1, are also provided to advance the die shaft gradually in its quill with a smooth, positive action. The end thrust on both shafts is taken on heavy roller thrust bearings.

Main Shafts Oscillated

To build up the structure and profile absolutely symmetrically on both sides of the teeth, it was found necessary to oscillate the two main shafts by repeated reversals in the direction of rotation. At first this was done by mechanical means, but the engineers of the General Electric Co. have designed a special motor equipment that now gives the desired motion entirely electrically. It is an adaptation of their planer drive equipment, modified to meet the rather unusual requirements of the rolling process. A control board, with three push button boxes provides a very elastic control. With one box the machine can be driven continuously either forward or in reverse and stopped at will.

Another box jogs the machine slowly either forward or in reverse to provide small movements of the shafts during die set-ups, etc. The third box controls the automatic operation with its oscillating motion. Pushing the start button causes the motor to turn automatically a pre-determined number of revolutions in one direction, stop, turn in the opposite direction, stop, reverse, and so on until the stop button is pushed. A limit switch driven by a one-way moving part of the machine, controls these automatic reversals. Its segments are arranged so that the die makes one and a fraction revolutions on the blank in each direction, but one of these overlaps is longer than the other, so that the point of reversal on the blank moves around the blank as it is rolled. This distributes uniformly the slight cooling effect of the reversals around the blank.

The time required to start the motor, bring it up to speed and stop it, varies from ½ sec. to 1 sec. in the two different forms of the equipment used. The motor rating is 12½ hp. at its full speed of 150 r.p.m. The corresponding shaft speeds are 100 to 150 r.p.m. In the slower equipment a dynamic brake is used to stop the motor before applying the reversing current; but in the



Left—Section of rolled gear tooth and, at right, of cut tooth, showing difference in the structure of the metal. The rolled tooth is said to be considerably stronger

other, this brake is used only for the final stop, the motor being thrown directly into reverse and a resistance momentarily cut in to prevent a short circuit. Interlocking protections are provided to make the equipment fool-proof.

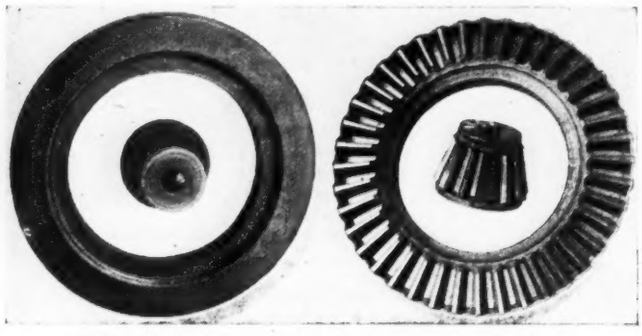
The motor is entirely enclosed and is equipped with forced ventilation and lubrication. The tremendously quick reversals are effected quietly, with no jarring. The total time cycle of rolling a gear has been materially decreased by this equipment and the current consumption is small.

The drive O for the cam is taken from an oscillating shaft at N and passed through a ratchet mechanism, which changes it to one-way motion. Thus the advance of the cam is proportional to the movement of the main shafts, so that when they slow down and stop during reversals, the cam does likewise. The action of the cam is to advance the die rapidly to contact with the blank; to advance it gradually to full depth; to hold it at full depth while the tooth is taking permanent form and is cooling below its critical temperature; to stop the die back slightly for one revolution; and to withdraw it quickly. The withdrawal is effected by a spring or by a return cam. During the displacement of the metal, the advance of the die per revolution is slight, so that the metal is worked and kneaded into proper form, and is allowed to flow into position easily and without strain. The total cam cycle for rolling one gear is about 20 sec.

The blank-holder is cooled with water during the brief space between rollings. While rolling, a baffle plate is interposed between the die and the blank, and a heavy flood of water is directed on the face of the die. This cools the die and keeps it at a temperature at all times bearable to the hand. The water acts to wash all scale from the die and the film retained on the die teeth as they enter the blank tends to loosen the scale on the blank, while the speed of rotation, aided by a blast of air from behind the intersection of the die and blank, throws off this scale entirely. The rolling is timed to continue until the blank is cooled below its critical tem-

perature, when no more scale is formed. The temperature contrast between the hot blank and the cool die causes the rolled gear teeth to be formed with a tough, highly polished surface.

The gear blanks are used just as they come from the drop hammers with commercial forging tolerances. It is not necessary to maintain sharp edges, consequently the hammer dies can be used for longer runs. The blanks are designed with a thickness about equal to that at the pitch line of the finished gear, as the metal is displaced both ways. This effects a 20 to 40 per cent saving in material over a cut gear blank. The edges are beveled so that the advancing die will cut through the metal and cause it to be extruded endwise



Left—Blanks for rolled bevel gear and pinion. Right—Bevel gear and pinion after rolling operation, showing shroud of extruded metal left after the rolling is completed. No machining of the teeth is required

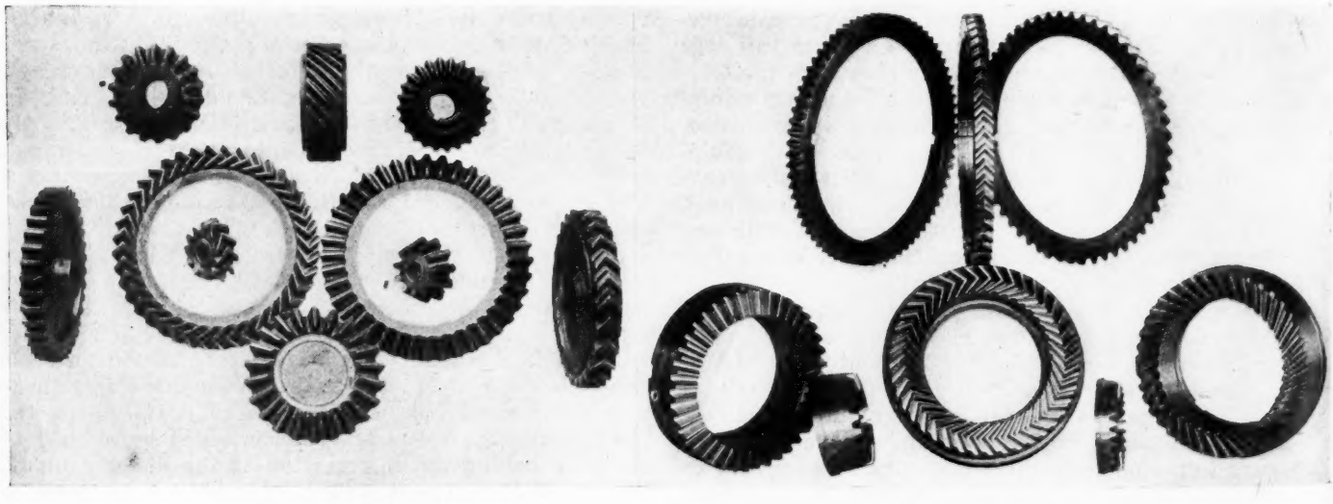
along the die teeth, the blank-holder allowing a certain space for free egress of the metal beyond the ends of the teeth. The blank is heated to its most suitable forging temperature—ordinarily about 2000-2100 deg. Fahr.—and is quickly and positively clamped in the holder so that there is no possibility of slippage. The holder restricts the expansion of the blank while it is being rolled, and allows its quick removal.

The die, P, is in the form of a master gear with plane surface tooth profiles similar to those of involute rack teeth. Teeth of this form can be machine hardened and ground true to profile, by simple mechanical means, with the utmost precision, making possible their accurate redressing at minimum expense. The die teeth are constrained to enter the blank on radial lines and in the same relative position at each successive revolution, hence there can be no distortion of the teeth formed.

In the design of all dies are incorporated the basic considerations of having plane surface profiles for the teeth, and making allowance for year so that one die can be redressed many times. As the temperature of the die is not appreciably raised during the rolling of a gear, the proportions of the die teeth are based on the expanded dimensions of the rolled gear at its critical temperature. This allowance for the shrinkage of the gear while cooling after being rolled, is so simply and accurately determined that absolute duplication of results is said to be assured.

Bevel gear dies are made with the nearest whole number of teeth less than the crown gear. Theoretically this tooth should have a slightly curved profile, but it is ground to the plane surface. Thus the die tooth is correct at and near the pitch line, but is slightly too thick at the top and bottom. This rolls a tooth with the slight clearance above and below the pitch line, which is said to have been found so desirable in practice. It is simple to make the true octoid crown die shown at A, Fig. 1, but the relieved die shown at B rolls a better gear. The die is redressed by grinding .010 in. off the tops of the teeth and bottom of the spaces and the proper amount off the sides to restore the correct tooth proportions. One bevel gear die, as ordinarily designed, can be dressed down ½ in. As 300 to 500 gears can be rolled with one dressing, one die will roll 30,000 to 60,000 gears or more.

Spur gear dies are made in the form of a circular rack 2 ft. in diameter. As the pitch of the average quantity production spur gear is rather small, when it is divided into so large a circumference the resulting tooth profile so nearly approximates a plane surface, that the difference is just sufficient to provide the requisite clearance above and below the pitch line of the rolled gear. Dressing these dies reduce their diameter, but this is compensated for by reducing the thickness of the teeth and spaces in proportion to the reduction in diameter. The blank and the die are constrained to travel together in fixed synchronized engagement by their timing gears, which are not affected by the change in the diameter of the die. While the reduced die thus maintains its relative angular velocity, its reduced peripheral speed introduces a slight creep which is said to just compensate for the reduced thickness. This die can be reduced ¼ in. or more in diameter without effecting the absolute interchangeability of the gears produced, and because of the large number of teeth in the die the intervals between dressings is several times that of the bevel die.



Hot-rolled gears of various types and some of the dies used in rolling them

On completion of the rolling operation, the faces and diameters of the gears have to be finished, but no additional work of any kind is done on the teeth themselves. The rolled gears are chucked on their rolled tooth surfaces and the finishing operations are performed on standard automatic machines. This establishes the correct relation between the finished surfaces and the pitch line of the gear and insures its proper mounting.

During the rolling of a gear the hot metal of the blank is gradually worked by the advancing die under 5 to 20 tons pressure, causing, it is claimed, an advantageous rearrangement of the structure of the metal. The makers claim that a dense fibrous structure is forged into a trussed formation about the periphery of the blank, serving to tie the teeth to the body of the gear, to help equalize warpage in subsequent heat treatment and to give a tough, hard wearing surface to the working faces of the teeth.

In the two cross-section photographs herewith furnished by the Anderson Company, this structure is contrasted with that of a cut gear in which the rough forged surface is first turned off, after which the teeth are cut through the lines of flow of the metal, leaving them weaker in the direction of the greatest strain. The Anderson Company states that laboratory tests have shown that a rolled gear tooth is 25 per cent stronger and 20 per cent harder than a similarly proportioned cut tooth of the same metal.

The strength of rolled gears can be still further increased by retaining the shroud, which is normally formed at the ends of the teeth. It is claimed that the strength of gear combinations could, in many cases, be increased 50 to 100 per cent by this means. Besides strengthening the gears, the shroud helps retain the lubricant and acts as a gear guard. Any form of gear can be made by this process.

Moving a Village by Motor Truck

THE Acme Motor Truck Co., Cadillac, Mich., has just built a trailer of unusual design that is being used in a unique and unusual job—moving practically an entire village a distance of eleven miles.

The town of Jennings, founded about twenty-five years ago by the Mitchell Bros. Lumber Co., is being moved to Cadillac, Mich.

The houses to be moved vary in size from 24 by 30 ft. to 24 by 40 ft. The weight of the houses varies from 15 to 35 tons and the 11-mile trip is made in about four hours, which includes all necessary stops to wait for traffic to pass before entering upon a stretch of road too narrow to allow passing.

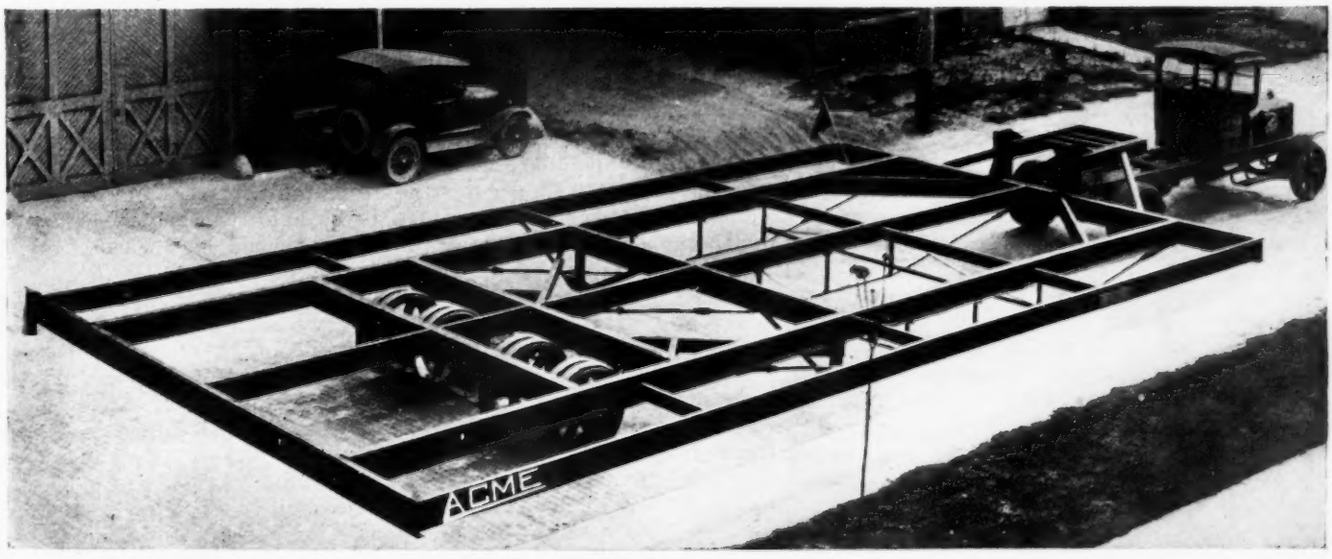
The trailer is constructed with a framework of heavy structural steel beams. A channel and I-beam platform, raised 18 in. above the trailer frame and rigidly connected to it, transfers the load at the forward end of the trailer to a rocking fifth wheel mounted on the truck. This construction eliminates all twisting stresses from the trailer proper.

The trailer frame is supported at the rear by four steel truck wheels abreast, equipped with solid rubber tires. Approximately 75 per cent of the weight of the trailer and load is carried on the wheels. The complete unit weighs approximately five tons.

Motor Vehicle Lighting Problems

IN Bulletin No. 63, mention was made of the work which the Bureau has been conducting in co-operation with the various states on the proper illumination of automobile license plates and their visibility under different conditions of illumination. During the past month this work has been continued, but the observations made up to the present time are merely preliminary and include only a few of the conditions under which plates must be legible.

This work is being conducted in connection with a committee of the Illuminating Engineering Society and with officials of several states. A large number of license plates have been obtained, and the work will be continued as soon as possible. Along this line, it is expected that later some investigations will be undertaken to determine the best form of numerals for these plates.



Special Acme trailer used for moving the homes and mills in Jennings a distance of 11 miles to Cadillac, Mich.

Selling American Tires in Great Britain

British use 1,200,000 casings per year, of which about 200,000 are American-made. Michelin holds first rank in replacement market, but Dunlop sells majority of tires for orginal equipment. Selling costs can be reduced by use of warehouses.

By P. L. Palmerton *

PRIOR to the World War the automobile tire trade of the United Kingdom was principally divided between Dunlop of Birmingham, England; Michelin, of Clermont-Ferrand, France; and certain American companies. There were also on the market automobile casings produced by Pirelli, of Milan, Italy; Continental, of Hanover, Germany; and Provodnik, of Riga, Russia, as well as by many of the smaller British and French companies. The aggregate trade of these lesser units, however, was not comparative to the share enjoyed by the two leading competitors, Dunlop and Michelin, who were trailed by the American companies. These two main companies held almost equal shares of the trade, with Dunlop, perhaps, somewhat in the lead. This statement pertains to replacement pneumatic-tire business and does not concern the original equipment business in which Dunlop had, and continues to hold, by far the leading share.

To-day, three and one-half years after the armistice, the British tire market is supplied mainly by Michelin. There is no escaping the complete ascendency of the well-known French tire. Some factors in the trade declare that Michelin alone is doing more than one-half of the total replacement business in motor-car tires, and observation in motoring circles finds evidence to substantiate such an estimate. The tires are imported from both the French and Italian factories of the Michelin Co. In second position to-day are found the American tires, if they are taken in the aggregate. It is not thought that any one American company is doing a replacement business equal to Dunlop, but it is altogether likely that the total of American tires imported easily surpasses the number which that premier British company supplies to the trade.

None of the many British tire companies other than Dunlop is of great consequence, their products being seen far less frequently than any one of five or more American makes. Pirelli ranks to-day with the lesser British companies, being followed by smaller French and Belgian companies. The reentrance of Continental has been so recent that it is not easy to assign its place at this time, but it is positive that not a great many German-made pneumatic tires have yet been put on the market here. A prominent distributor, with headquarters in Manchester, has taken up the line. The tires are handsome in appearance, having a jet-black tread in an attractive nonskid pattern and cream-colored side walls. It is not yet possible to find any of these tires which have run for a sufficient length of time to judge their quality.

One factor in the trade was willing to offer the following percentages as representing the shares of the replacement tire market now enjoyed by those competing: Michelin, 60 per cent; American companies, 15 per cent; British companies, including Dunlop, 16 2/3 per cent; other non-British companies (Pirelli, Continental, Bergougnan, etc.), 8 1/3 per cent. Tires from Canadian factories of American companies are counted as American tires in this estimate. But before looking into the actual amounts of trade enjoyed by the above competitors and the reasons for their ascendency or descendancy, it may be best to consider the size of the market and the things affecting it.

Size of Market

The London branch houses of American tire companies estimate that there are at this time 300,000 passenger automobiles operating in the United Kingdom; approximately 75,000 of these are taxicabs in steady use.

One of the oldest sales managers in the British tire trade states that tire consumption per car per year in this market has not fallen far from six tires, where it was acknowledged to stand some two years ago. The large consumption of tires by the taxicabs (it will be noted that they account for one car in every four), especially of the shorter-lived steel-studded tire, operates to keep the average high, but the improved quality of tires, and especially the introduction of the cord tire, has tended to pull the average down to a point where many conservative factors in the trade are willing to figure on four tires per car per year. If we adopt this figure we then put the potential British market for automobile casings at 1,200,000 per annum. Since America's greatest share of the tire trade of the United Kingdom is estimated to be approximately one-sixth, it should supply in the neighborhood of 200,000 tires to this market during the present year.

Since the detailed figures of imports of motor-car tires into the United Kingdom have been published in full by the Rubber Division, they will not be repeated here.

As has been indicated above, Michelin at present holds the prominent place in the market, followed by the American companies, the British companies, Pirelli and Continental. Since the failure of the home companies to dominate the market must surely be the leading contributing reason to the ability of other companies to hold the premier place, the reasons for such failure should be understood.

*Chief, Rubber Division, Bureau of Foreign and Domestic Commerce.

In the first place, attention may be directed to the fact that automobile tires enter the United Kingdom free of duty, so that imported tires enter competition without any assessed handicap other than ocean transportation.

The decline in the business of the British tire manufacturers has really been the decline of the business of Dunlop. This fall from favor has been almost altogether due to variability in quality. Following the war, Dunlop brought out what was reported to be an improved fabric tire, the Magnum. Its failure to perform as Dunlop users had come to expect led them to change makes, and Dunlop has never succeeded in bringing them back. The potential strength of the Dunlop Co. must not, however, be underrated. There are indications that their tires are regaining more and more of their old popularity with motorists, and recent notable additions to the directorate of the company should not be without their beneficial effect. In a few months the market value of the ordinary capital stock of the company has recovered from £3,750,000 to £6,750,000.

The Dunlop Co. has always figured prominently in the original equipment business of England and continues to do so, particularly in connection with the larger cars, such as Rolls Royce, Sunbeam, and Vauxhall. Several light cars have been driven by competition to secure original tires at prices below those of Dunlop, and are accordingly appearing on various other makes. American companies who bid on some of the business report that it was awarded at very low figures.

British tires other than Dunlop did not do such a large share of the business before the war that their present status can be said to be lowered very much. The fact is that practically all of them undertake the manufacture of a wide range of rubber products without any particular specialization on tires, and accordingly the lack of prosperity in their tire departments is not a matter for such great concern. This division of interest may account for the fact that British tire manufacturers are often accused of being unprogressive, both in the matter of perfection of product and greater efficiency in production. The natural conservatism of the Britisher toward newer processes or types of products surely enters here. It may be said without prejudice that British tires to-day are not equal in quality with the leading American makes.

P. L. PALMERTON is chief of the Rubber Division of the Bureau of Foreign and Domestic Commerce. Last spring he went abroad to get merchandising facts about foreign markets for American manufacturers.

* * *

This report on the British market is the first to come back. It is one of those rare reports which presents all of the essential facts and figures, but includes as well a brief, comprehensive interpretation of them.

* * *

This story tells about trade practices in the tire business of England, outlines the chief competition, shows where American products now stand, and shows how American marketing methods can be improved. Merchandising cost figures are given.

Value of Quality

American tires and Michelin tires are both regarded as of high quality, even Americans in Great Britain being willing to concede the high and consistent quality of the Michelin tire, although not regarding it as the equal of the best American makes. The Britisher, however, sees little choice between them. This recognition of the merits of tires imported from at least two countries naturally hurts the sale of British-made tires and has caused the British Tire Manufacturers' Association to ask the Government to put into effect the 33 1/3 per cent import duty as proposed in 1915; but no such action has yet been taken, and it is not believed that it will be.

The Ascendancy of Michelin

There are two or three reasons to account for the strength of Michelin in this market. In the first place, Michelin is a pioneer manufacturer of automobile casings and has sold in the British market for many years. The Michelin sales organizations have always been keen, energetic, and well managed. The policies have been carefully chosen and, under the tutelage of the one leading spirit of the company, have been religiously followed out.

The main point in Michelin's strength has been unvarying quality. New products or improvements in old ones have apparently been so well tested before being offered for sale that the many fiascos common to so many companies have been almost totally absent. Thus we have a pioneer company which has surrounded itself with a reputation for dependability, and any conservative buyer is naturally slow to abandon the use of its products.

The early appearance of the Michelin beaded-edge cord tire also is a big factor in the present ascendency of the company in this market.

Before the war Continental's strength in the market lay in solid tires rather than pneumatic, and the same apparently will hold true to-day. It is noticed that although the British sentiment against German-made goods is gradually dying out, the plainness with which an automobile casing is branded advertises the use of a German tire far too much to suit the average British motorist. This feeling is stronger in provincial England and Scotland than in the city of London. There is less sentiment in business and less tire prominence also, with the result that the truck-tire user will more readily readopt the Continental solid tire. It is assured, however, that very few German-made tires have entered the British market this year, but the solid tire especially can be expected to regain a good part of its former trade. Such Continental tires as are now being sold here are on a price level with other makes, but the dealer is rewarded with slightly better discounts.

Pirelli are to-day doing fairly well in this market. The quality is regarded as common, and the prices are about the same as all others. The lesser British and French makes enjoy a fair sale. The Hevea tire of Holland is just being introduced.

Most of the British business in American tires is done in five makes. Other makes are represented, but are seen only infrequently. In the aggregate American tires stand in second place in the market. This position is theirs on account of the pioneer work of certain American companies, the high and usually consistent quality of American tires, and the war and early post-war periods which gave them a chance to become firmly intrenched.

A fair part of the recent imports of American tires into Great Britain has not been of the makes usually found here, but has consisted of various lots of tires cleared out of American factories at very low prices. Similar lots of Canadian tires have also appeared. These tires are nearly all fabrics, principally in 30 x 3½ and the most popular metric sizes. This deluge of clearance stocks has tended to demoralize the legitimate market, since they have been sold at very low prices. Their appearance is accounted for largely by overproduction and the resulting large inventories in the United States. The metric sizes come to a large extent from factories which were equipped in the post-war period with metric molds and which to-day are finding export markets more difficult.

The desire to clear out fabric stocks to make way for cords has also had its influence, although a larger quantity of special brand and second-grade stuff has been included. The exporting has been done largely by tire jobbers in New York. The stocks have not always been fresh or of good quality, and both the sales and prestige of American tires have suffered as a result. Disappointment with these more unreliable products, however, is leading the British motorist to refuse to buy them even at their low prices, and the influence of these stray stocks is subsiding as a result.

Sales of American tires are effected largely through branches of the parent company located in London. From these main offices branch offices are spread through Great Britain and Ireland; these may number from five to a dozen, each controlling sales in a certain section and stocking the surrounding dealers. The number of travelers from these branch offices is often large. Some of the branch companies handle Scotland and Ireland through branch offices, while others assign the territory to agents in Edinburgh, Glasgow, Dublin, or Belfast. There is also a fair amount of direct importing done in Scotland and Ireland, either by import dealers or by distributors. The tire trade in Ireland is largely dormant at this time, the largest demand coming from the military establishments.

How the Tire Trade Is Handled

The American tires not self-represented are in the hands of agents, usually selected for their familiarity with the tire market, gained through experience with British or other makes. They are commonly given from 35 to 40 per cent discount from the consumers' list. Time is given them up to 120 days in some cases.

The branch houses and manufacturers' agents commonly sell or consign to the tire dealers or traders at 20 per cent off consumers' list; in straight sales 5 per cent additional is allowed for cash in 10 days and 2½ per cent for cash in 30 days. It is admitted that the time limit, however, is not closely drawn, and if payment is made within six weeks the trader is apt to claim and be allowed the 2½ per cent discount.

The practice of consigning tires to dealers, or selling "sales or return" as it is more commonly expressed, is still in force, fully two-thirds and possibly as much as three-fourths of the tire business being done on that plan. Under its provisions the dealer is stocked with tires, for which he does not remit and which remain the property of the manufacturer, the dealer becoming only a sales agent for them. At the end of each month the stock is checked and the dealer pays the manufacturer for the tires sold during the period, retaining, of course, the difference between the manufacturer's and the retail price.

The "sales or return" system naturally appeals to the dealer, because he has no investment in stock. Thus it becomes a sales aid to the manufacturer, who uses it for that one powerful advantage, in the face of the disadvantage of having a tremendous investment in stocks scattered all over the country. Since the dealer has no investment in the stock, he has no particular interest in turning it and may often be encouraged to purchase on time at a slightly greater discount a second or third stock to whose sales he will devote the greater part of his energy, since it pays him better, and he is forced to get his money out of the stock in order to pay his bills. Thus the aggressive dealer may prefer to avoid the "sales or return" system, while the more slow-moving conservative dealer, who sells goods only on popular demand, prefers it.

The use of the "sales or return" system is declining slightly, but, as has been said, at least two-thirds of the business is still done under it. All the American houses having branches in the market, place stocks with dealers on a consignment basis, but the practice is not so readily adopted by agents for American tires. About one year ago an agreement was made among the tire distributors for the abolition of the practice, but since some companies did not adhere to the agreement it naturally disappeared. To-day consignment is regarded as almost inevitable.

Tire Advertising

Under the keen competition in the market some American companies have not found it possible to send in tires at the common market price and still allow sufficient discounts to interest a distributor in handling them. The result has been the elimination of the distributor and the entrance of direct importing on the part of important dealers. The sales are effected by a factory representative or by a salesman on commission. Shipments are made to the dealers' nearest port, payment sometimes being made by draft against documents.

American tire companies are spending less to-day on advertising than formerly. To keep their prices on the same level with Dunlop and Michelin, they do not find a sufficient margin to enter into extensive advertising campaigns. Dunlop and Michelin are apparently making greater investments in advertising and are keeping their names more prominently before the public. This is done in part through road maps and guides, which are exceedingly elaborate and detailed. Large enameled road signs are commonly used. These tires are also prominently advertised on the many omnibuses on the streets of London. The many motoring journals of London, as well as the London and other daily papers, are freely used, a good representation being made by the smaller British tire companies. British tire advertisements are commonly flavored with a patriotic appeal for the readers to use British products in order to give employment to British workmen; it is also suggested that such action will reduce the motorists' taxes, since it should mean a shrinkage in unemployment.

It is common practice for agents for American tires to ask for and secure a special discount for advertising purposes. This discount often is set at 2½ per cent of the gross purchases. In some cases the agent or the dealers to whom he sells agree to put in an equal sum.

Automobile casings are not commonly guaranteed for any specific mileage in this market. Some of the less prominent makes are still sold with definite mileage guaranties, but the effect is not so noticeable. One exception to the custom of selling with guaranties toward defective workmanship and materials only is that of a well-known American tire handled by an agent who guarantees it for 5000 miles' service regardless of abuse or accident. This broad guaranty is used as an introductory feature.

The keenly competitive condition of this market has raised the question of cheaper distribution, of which the direct importing by large dealers mentioned above is an outgrowth. The distribution of imported tires is commonly effected through representation by a native firm or through a branch office of the parent company; the first demands a comfortable margin on all purchases for expenses and profits, while the second is admittedly extremely expensive.

Direct importing by dealers after sales have been effected by a traveling representative of the factory eliminates the usual office expense or the margin to the native distributor, and the direct importer can accordingly be allowed a greater discount from the consumers' list. The goods are forwarded c. i. f. dealers' nearest port. The greatest fault in this scheme seems to have been the length of time intervening between the placing of the order and the receipt of the goods. This delay necessitates the dealer anticipating his wants far in advance, and he feels most keenly the lack of flexible delivery. This disadvantage may be avoided by backing up the factory representative with a stock of tires in an inelaborate warehouse, from which shipments can be made to his order.

This warehousing of tires may be accomplished in either of two ways—first, the renting of warehouse space and the installation of a very small staff for handling stock, or, second, through a warehouse company already established which will receive goods under bond and make shipments on order for a set charge per tire.

Under the first plan of operation a warehouse of sufficient size to permit the stocking and handling of 8000 to 10,000 tires may be secured for approximately £400 per annum. A responsible clerk may be secured at £200 per annum to direct the receipt and dispatch of goods and to keep the stock record. Two stock handlers at £150 per annum and an errand boy at £50 would complete the necessary staff. Thus for £950—say, roughly, £1000, or $5000—the company's representation could be backed by facilities for deliveries as convenient as British or any other manufacturers could offer. The cost of warehousing and handling tires through an existing warehouse company is not yet definitely established, since the conditions of each contract are apt to differ, and the practice is not one with which warehousemen are very familiar. Estimates as to cost can be readily secured, however, when all details are outlined.

Tire Prices

In what may be called the "legitimate" tire trade in Great Britain there is no price war, and there is none in prospect. Michelin has largely controlled the price situation in this market. American prices have usually been a little higher than those asked for British or French tires. The price scale in effect at present was introduced almost simultaneously by Dunlop and Michelin with very slight variations between their consumers' lists. The American tires have followed the lead of one of their number and have put their prices on what is practically a parity with all standard makes.

The progress of the cord tire in the British market has been very rapid. It was introduced later than in America, but it has come to dominate the market fully as quickly. The almost total disappearance of the fabric tire is claimed to be a matter of a year or very little longer.

The Michelin beaded-edge cord tire was the first to appear and has derived a great advantage therefrom. Practically all the British companies now offer beaded-edge cord tires in metric sizes, although certain ones are still delinquent, to the great disgust of their agents. American companies generally were slow in getting on the market with such a tire, and, in fact, the list offering the cord tire in metric sizes is small indeed. Several American companies which have operated prominently here are not yet ready with a metric cord, a fact which causes the greatest dissatisfaction and impatience on the part of their agents.

Certain American companies report their present sales to be 80 per cent cord. In the face of such demand the companies offering only fabric tires are naturally at a great disadvantage.

Certain importers of American tires report that American metric cord tires were too highly priced when introduced, a fact which they account for by the desire of the companies to mitigate the high first cost of mold equipment for producing the tires. This condition has now remedied itself, but it made the introduction of the tire more difficult.

The Straight-Side Tire

The straight-side tire is used in the United Kingdom on cars of American manufacture which have been imported on straight-side rims. It is impossible to ascertain the number of cars so equipped, but it is small, since many American cars were imported with beaded-edge metric tire and rim equipment. Such prejudice as existed to force the importation of American cars on other than their usual tire equipment has largely disappeared, and there are to-day only two American cars taking tires larger than 30 x 3½, which are steadily coming in with beaded-edge tires and rims.

The percentage of straight-side tires among all those sold is not high; it is commonly admitted that 5 per cent is a generous estimate. A good share of this straight-side tire business is in the size 32 x 4½, used on the rear wheels of Ford vans.

Clincher tires in inch sizes, principally 30 x 3½, account for a greater percentage (usually placed at 10 per cent) than do the straight sides. This leaves 85 per cent as the estimate of beaded-edge metric tires in use, and it is agreed that it is not too high.

The Dunlop Co. believes firmly in the principle of the straight-side tire and has been active in the manufacture of both straight-side tires and rims to offer to the motor trade of the United Kingdom. Dunlop is said to furnish about 90 per cent of the original tire equipment for the British motor cars, and their belief in the straight-side tire can be expected to have an effect on their customers. Some of these have already fitted some cars with straight-side rims, but only in occasional cases. The satisfaction they have given supports the belief that before long certain British cars will appear on straight-side tires.

Contrary to the case in America, the motorist here has a distinct feeling against the greater weight which accompanies the straight-side tire and rim as it is used in the United States.

If the British car accepts the straight-side tire on a detachable rim the split rim will of course be eliminated, just as it is eliminated to-day in America where detachable wire or disk wheels are used. The straight-side tire will benefit thereby, for no one thing has aroused greater ire against the straight-side tire than the split rim, which has never been easy to operate. The British detachable wheel is already perfected, and the rapidity with which a chauffeur can change wheels is something of a revelation.

The adoption of the straight-side tire as original equipment by the British motor-car manufacturer would naturally lead to an elimination of the metric tires alto-

gether, since the smaller beaded-edge tires which are British standard are in inch sizes. The 760 x 90 size, which is an important one, is apparently the same as the 30 x 3½ and would likely be entirely replaced by it. The most important size having no present American standard equivalent is the 710 x 90. It is anticipated that the 28 x 3½ will replace it, for, in fact, that size is already a standard for light cars in Great Britain and is already offered.

Popular Tire Sizes

The 815 x 105 and the 820 x 120 are the most popular sizes of tires on the British market to-day. In the light-car sizes, 710 x 90 and 760 x 90 are the leaders. The size 810 x 90 is going out, and the 870 x 90 has already been discarded. Size 765 x 105 is important, but probably five times as many of size 815 x 105 are sold. In the 120-millimeter range the 880 and 820 are apparently of equal importance, but the popularity of the 820 is increasing as the former decreases. The advent of cord tires has decreased the popularity of oversizing, which accounts for the decline of the 150-millimeter ranges.

The most popular straight-side size is the 32 x 4½, for the reason explained above. The 32 x 3½ is probably second in importance along with 33 x 4.

The British market shows such a strong preference for the red tube that it is almost impossible to sell any other. Gray tubes are sometimes used as original equipment, but practically every motorist insists on having a red tube for replacement. A red tube of bright finish is the best seller. The inability of American manufacturers to supply red tubes for some time and their failure to give their first red tubes an attractive finish have kept them from securing a better place in the market. Michelin has always produced a red tube and a good one, and so has risen to an enviable place in the trade. The sale of "unknown" tubes, many of them of domestic manufacture, is also a feature of the trade, as it is in the United States. In the face of these conditions it is plain that only a high-quality red tube of good finish can hope to succeed. The tube prices, like those of tires, are without serious differences.

Predict Big Future Sales

All American companies operating in the British tire market are optimistic concerning their sales during 1922 and in the future. The invoiced value of automobile tires shipped from the United States to the United Kingdom in 1921 stood at $3,357,239. This total is more than double that of any pre-war year and was surpassed only in 1916 and 1920. The war of the first of these years and the hysteria of the second have gone. The total of $3,357,239 was reached in 1921 with very conservative buying and bids fair to be equaled or even surpassed in the current year, which is the basis for the optimism mentioned above.

American sales may have been increased but American prestige was certainly not affected in the same manner by the indiscriminate selling of stray stocks of blemished or clearance stocks which has been discussed herein. For the most part they have not been satisfactory, and the conservative British motorist, tempted by price to change his usual procedure and buy according to something other than established reputation, again changes makes, with more or less indiscriminate disgust for American tires.

It is said that sporadic sales of special brand or clearance stocks tend to surround all American tires with an air of unreliability or instability. Since the tires which appear irregularly are necessarily sold on a low-price basis, the market is demoralized by them and the ire of British tire manufacturers against all American tires is aroused. Americans who hold regular places in the trade are plainly relieved at the tendency of these stray stocks to subside.

Irregular Policy

The irregular appearance of various tires on this market, at times when it is thought to be more convenient than profitable for their makers, is perhaps a reflection of the irregular policy which some American companies have followed in exporting to the United Kingdom. Their practice of definitely putting their domestic business first in development or supply, sometimes to the entire neglect of their British business, has a particularly malicious reaction on their agents or representatives, because the British motorist buys largely on reputation, which can not be built without regular or complete stocks of those goods particularly suitable for the market. Some agents and representatives still find themselves handicapped by slow and irregular deliveries, the lack of cord tires in metric sizes, the lack of red tubes instead of gray and so on. It must be believed that these things and the attitude back of them are cheating the American tire trade in Great Britain of some of its rightful growth to-day. The keenness of competition should be sufficient demand that handicaps be removed wherever possible.

Since the total tire business in any territory has natural limits, the growth of American tire sales in Great Britain depends upon the ability of American branch houses or agents to take business away from their present European competitors. These competitors have natural advantages arising from location and age, but where they are in superior positions it is partly due to persistent effort, less variability in product and policy, and alertness as to the needs of the market. American companies have met them in prices, and there is no doubting their intention to meet them in practicing the above policies in order to enjoy the increasing volume of business upon which substantial or worth-while returns can be based.

American Sales in England Increase

THE serious dislocations caused by the engineering lockout during the first part of this year in the British automotive industry have proven very difficult to overcome, according to Asst. Trade Commissioner Park of London.

The export trade continues to decrease, while imports of foreign cars have steadily increased since the first of the year, despite the 33⅓ per cent import duty. The United States and Canada remain well in the lead in British imports of passenger cars, which are dutiable, while France and Italy are ahead with respect to complete motor trucks, which enter the United Kingdom free.

Sales of American cars in the British market have improved steadily and will continue to hold a good market as long as they can give a better value for less money, as is true at the present time in many cases. Recent price reductions have been made by the representatives of several American cars on the market due to satisfactory increases in business.

Will the "All Loss" Type of Lubricating System Return?

This possibility among the items discussed at the recent lubrication meeting of the Metropolitan Section of the S. A. E. Well fitted pistons and rings and true cylinder bores considered essential for proper functioning of any oiling system.

MANY angles of lubrication were discussed at the meeting of the Metropolitan Section of the Society of Automotive Engineers in New York last week. Two papers were read. Finley R. Porter described and criticised the different oiling systems that have been and are being used, and George A. Round added some new data to the paper he gave at the Summer Meeting of the Society at White Sulphur Springs last June.

Porter expressed strong preference for the force feed system of lubrication, especially in combination with an external reservoir which gives opportunity for screening and cooling the oil in the most efficient way. He also stated that the now abandoned system of feeding each point in an engine with fresh oil which is not recirculated has advantages worthy of consideration, in which view he was supported by the discussion. With respect to this system Porter said:

"Contrary to the general trend, there is one type, that of the "all loss" system, which the writer believes worthy, with modifications, of further development, which is fast disappearing from use in general practice. The "all loss" system is defined as one wherein the oil distributed to the several surfaces to be lubricated is intended for total consumption, either by leakage or burning, and is supplied in as nearly the right quantities as possible to prevent undue waste.

"Early practice along these lines shows every indication of, and did, without doubt, follow the lines of steam engine lubrication, since the majority of designers at that period were graduates from the steam engine school. Following the period of hand filled sight feed oilers in connection with this system, mechanical oilers directly connected to the engine came into use, and were very effective except for the fact that the supply control being a function of engine speed, great difficulty was experienced in maintaining a proper supply over the full range of engine speeds.

The Splash Lubricating System

"Owing, no doubt, to the difficulty and intricate apparatus necessary for keeping the rate of supply within the limits of consumption, this system was abandoned largely in favor of the "straight splash system," wherein a given quantity of oil was placed in the engine base and renewed from time to time, thereby maintaining a more or less constant level. This system, known as the "splash system" is still in use to some extent, but in the writer's mind is not deemed worthy of consideration in connection with future development."

Porter then described various systems of force feeding with respect to the several types of automobile and aircraft engines and finally summed up as follows:

"A brief review of the motor vehicle field discloses the following distribution of systems:

	Pass. Cars	Comm. Veh.
Straight Splash	9	69
Force, or Dry Sump	72	364
Force and Splash	83	229
Total models	164	662

"The above figures disclose the straight force feed, or dry sump system predominating in the commercial vehicle field, while the combined force and splash predominates slightly in the passenger car field.

"In the nomenclature of the automotive fields, the dry sump systems are designated as forced feed systems, but for the sake of comparison and discussion will be referred to hereafter as dry sump systems—which it is believed will more clearly designate them when compared to splash, and force and splash systems.

"The ideal would be an all-loss system wherein fresh oil at a temperature not to exceed 150 deg. Fahr. would be supplied to timing gears, vertical shaft and camshaft bearings, main bearings and connecting rod bearing and wrist pins, with all returns collected and distributed in proper proportion to the cylinder walls at a temperature not to exceed 160 deg. Fahr.

The Dry Sump System

"Since this is obviously impossible, it is proposed to consider a dry sump circulating system with initial pressures ranging between 80 and 100 lb. and oil temperatures being maintained between 100 and 160 deg. Fahr. A separate reservoir should be employed connected to the suction end of the main circulating pump of the gear type with a cooler located between the reservoir and pump with radiator outlet water used as a means of controlling the temperature.

"The discharge or pressure line should lead directly to all main bearings, gear and camshaft compartment. The supply to connecting rod bearings should be through a hollow crankshaft with properly drilled ducts to the crankpins controlled by partial registration at the main bearing. Supply to the wristpins should be through a small tube, or hollow connecting rod, to the inside of wristpin. The wristpin bosses should be the closed-end type with distribution holes drilled through the wristpins to the working surfaces.

"Control should be had by proper length radial grooves that register only on the top stroke, since the registration would be direct with oil hole from main bearing. Sufficient lubricant would be assured regardless of the big end bearing fit or the amount of oil being fed to the connecting rod

bearings. In effect this would be at extreme outer stroke, a direct connection to the pressure feed on main bearings.

"The supply to all gears should be through a high pressure jet of sufficient size sprayed directly on the meshing side of each gear train, with the overflow, or return so conducted to the main sump as to avoid contact with main crankcase compartment.

"A separate sump pump should be utilized with an excess capacity for the return of all oil to the main reservoir."

Maintenance a Problem in Pressure Systems

Round took a different view from that of Porter, stating that, in his opinion, the force feed system is seldom justified for passenger car work. In the course of his paper he explained that one of his principal reasons for holding this view is the inability of the average repair shop to properly maintain force systems.

His paper dealt mainly with troubles encountered and he said that there are two general classes of complaint: that of excessive carbon deposit and that of excessive oil consumption, the two not necessarily going together. With either of these the fault might lie in design or workmanship, the latter of course including the workmanship of repair shops. As an example of faulty design he mentioned the use of extremely thin piston heads which, by reason of their lack of conductivity, would heat up to knocking point with quite light carbon deposits. Where very thin sections are used he said "the slightest carbon formation blocks the flow of heat from the charge and raises its temperature to the critical point. From our experience we feel that fewer complaints of knocking would be received if designers would give more consideration to this point."

LUBRICATING problems appear to be more difficult and numerous than ever, due in part to failure to properly fit pistons and rings, to cylinders which are not machined to a true circular form and to dilution of lubricant by fuel. These problems are felt keenly in the service station and return to perplex the manufacturer when they are due to carelessness on his part.

In this report some troubles are outlined and certain remedies suggested. The subject is one which deserves much study and should have careful consideration by executives as well as by engineers. Discussions pointing the way to overcoming lubrication troubles and intended for use in the Forum will be welcomed.

Troubles with all forms of oiling are due, of course, to improperly fitted pistons or rings, and this phase was discussed most of all. However Round described a way in which splash systems could sometimes give trouble due to design alone. He said:

"Recently we received from several different points reports that a certain car was giving a great deal of trouble from fouling of plugs and carbon deposits. Investigation showed that through some mistake, extra long connecting rod bolts were fitted. These dipped into the oil and created an abnormal splash. Dropping the oil level effected a temporary remedy. To our knowledge this apparently minor detail seriously affected sales of this car because of the reputation for oil pumping which it was acquiring. The loss in this way would seem likely to be much greater than the cost of seeing that such errors do not occur.

"In cases of oil pumping which cannot be attributed to an oversupply of oil reaching the pistons, defective and worn rings are mainly responsible. While the latter are to be expected in used cars it is surprising to find a large percentage of defective rings in new cars. A typical example of what has been found in regard to this was reported in the Summer Meeting Paper.

"Working loose of the rings in their grooves gives rise to much of the oil pumping troubles experienced in worn cars. Where aluminum pistons are employed it is particularly advantageous to use narrow rings in order to reduce the hammering action on the softer metal and consequent widening of the grooves. The use of a type of ring which stays tight in the groove throughout its life is also advantageous. Where a plain ring is fitted initially with the correct end clearance, little trouble is experienced due to an increase in this clearance in comparison with that from the change in groove clearance.

Regarding the proper ring tension, some have recommended a higher figure than we suggested; viz. 2 lb. per sq. in. of diameter for a ¼-in. ring. In some cases this is undoubtedly helpful but in the average passenger car the high tension ring wears much more rapidly. The ring having a slightly beveled face is an example of this. In most cases such rings come to a full seat after a thousand miles or less when their advantage ceases.

"There is a wide difference of opinion regarding the merits of oil return grooves. Our experience indicates that they are of value when provided with adequate drain holes. In many instances they have cut the rate of oil consumption in half. Only in rare instances have they proven a positive detriment.

"As to the new type of constant clearance aluminum piston, the absence of the large number of oil pumping reports received with the old type piston seems to indicate a decided improvement. In a few cases trouble has been experienced but could be attributed to other causes."

In opening the discussion A. Ludlow Clayden reminded the meeting that the all loss system is still used on the British truck Albion and that total consumptions are claimed for it comparable with that for other systems. Dealing with the quantity of oil required he said:

"We are liable to forget the oiling systems of two decades past, but many here will recall the Bosch equipment and the similar device fitted to many of the early European machines. The Bosch, which was the most elaborate, consisted of a combination pump and distributor which supplied oil through individual leads to each bearing and to each piston. The preferred method of drive was a worm actuated crank with a long connecting rod, the oil container and pump being mounted on the dashboard and the crank situated somewhere near the rear end of the camshaft.

The "All Loss" System

"This system was intended to replace the previous method of mounting a long row of drip feeds with sight glasses on the instrument board and was an improvement in so far as the pump was more positive than the gravity feed to the drips. The intended function of both was the same; to furnish each point with a supply of new oil at regular intervals in proportion to the speed. It was a complicated, messy and troublesome system, but then nearly everything about a car could have been similarly stigmatised at that time. No doubt the individual feed arrangement could have been simplified and cheapened had not the circulatory system come along and displaced it.

"Probably few engineers know that one of the most successful British trucks—the Albion—has always used this system and still does so. I have a recent letter from the

chief engineer of the Albion company telling me that no changes are anticipated for the near future and that the economy of the system is quite comparable with that of conventional circulating types. Of course, in the Albion system as in the old Bosh and Panhard the oil once used in bearing or cylinder never returns to the tank; it is dropped into an empty oil pan and allowed to escape.

Oil Consumption 100 Drops Per Mile

"When one has got out of the habit of thinking about such oiling systems it seems extraordinary that anything like reasonable economy could be possible, so it is perhaps instructive to figure oil consumption in a rather unconventional way. Assume a six-cylinder passenger car having a normal performance of 500 miles per gallon of oil. It is safe to say that of this gallon, one third at least is lost by leakage and in vapor through the breather, so we have to account for two thirds of a gallon as being actually consumed by the engine.

"Allowing for all low gear work the average revolutions per mile on a passenger car are about 3150, and with a six, this means over 9000 power strokes every mile, or about 5,000,000 each 500 miles. A gallon contains between 75,000 and 80,000 drops of oil, which means that two-thirds thereof contains close to 50,000 drops so the consumption in terms of power strokes is 100 power strokes per drop, or in miles 100 drops per mile. A hundred drops is approximately 5 cc. The object of quoting these apparently uninstructive figures is to show that if we returned to a system supplying fresh oil only, without circulation, the minimum possible supply to be striven for would be not far removed from 5 cc. per mile.

"The real trouble is that we have acquired the habit of using oil for all sorts of purposes other than lubrication. It is to be doubted whether a system like the Albion would keep sufficient oil in various parts of the engine to quiet the action to the degree to which we have become accustomed. A heavy oil covers a multitude of tolerances. Also we have come to rely upon oil to act as a cooling agent and probably without a circulating stream of it we would be unable to attain the rubbing speeds and loads now common in passenger car work, although, of course, fresh oil would always be cold oil. I do, however, believe that the system is well worthy of study and re-experimentation for tractor engines and that the cooling of bearings could be accomplished by means other than rapid oil circulation. For instance in many engines, especially of the heavier type, there would be little difficulty and probably no added expense in arranging to water jacket the upper halves of the main bearings.

"The continuous feeding of comparatively small quantities of fresh oil would overcome all dilution troubles and, in tractors, most of the cylinder wear difficulty; the question is whether the quantities could be small enough to give an economy comparable with that of the conventional system at a total cost of manufacture smaller than that involved in the installation of continuous regenerative attachments."

The Service Man's Viewpoint

The service man's viewpoint was given forcibly by Ralph C. Rognon. He said that the most difficult thing in service work was that things which would cure oil pumping in some engines would not work in others. He expressed strong approval of the type of ring which expands sideways in its groove as well as radially, but said that this had not invariably proved able to effect a cure.

Largely in reply to this speaker several points were brought out in discussion that were not mentioned at White Sulphur. H. M. Crane again described his preferred type of piston, having a parallel skirt with a scraper ring so arranged that it emerged from the bore to the extent of half its width at the bottom of the stroke. He showed that an improperly placed piston pin would inevitably cause piston cocking and said that no ring could possibly compensate for such a movement. The skirt should, he said, be practically equal in length to the bore and the piston pin be located midway of the skirt, the ring-carrying portion not being reckoned as part of the cross-head. Crane stated that, with pistons of this type and a scraper ring, high oil pressures are practical and considerable latitude on cylinder accuracy can be allowed.

There has, this year, been an unusual amount of trouble with new cars. This the speakers attributed mainly to poorly fitted piston rings and to rings themselves of poor accuracy. Oil dilution as such was not much mentioned.

Porter in his paper said that it was rightly to be considered a carburetion problem and other members supported this view. Dilution usually is found associated with oil pumping when the latter is due to piston or ring imperfections.

Points Agreed Upon

The meeting was not so well attended as it should have been, but the Section has seldom had a better discussion, adjournment not being made till well after eleven o'clock. It appeared that there was fairly general agreement on the following points:

That the forced or, to use Porter's more accurate phrase, "dry sump" system is the most logical where adequate standards of design and workmanship are to be had and where intelligent maintenance exists.

That the conventional circulating splash system is adequate for normal passenger car use, but requires, in common with all other systems, properly designed pistons, properly fitted rings and true cylinder bores.

That the "all loss" or individual feed system is worthy of consideration for some classes of service, perhaps tractor work.

Finally, and most important of all, that service stations and repair shops would benefit greatly from a better appreciation of the bearing fits, depth of splash dip and other factors affecting the performance of all the systems.

Canada Spends $50,000,000 on Highways

FIFTY MILLION DOLLARS will have been spent on improving Canada's highways, many of which are of the asphaltic or resilient types, when the five-year period terminates in the fall of 1923, according to reports received by A. W. Campbell, Dominion Commissioner of Highways. Of this total $20,000,000 will have been appropriated by the Dominion Government and the remainder by the different provinces. Of the Dominion sum there is yet $800,000 to be taken up by the provinces.

Agreements have already been entered into by the Province of Ontario calling for an expenditure of $12,500,000 by the end of 1923, of which sum $5,000,000 is the Dominion share.

The New Brunswick Government now has all of its appropriation of $3,000,000 under agreement, the Dominion Government contributing $1,200,000. A total of 1595 miles of highways are scheduled for improvement.

Alberta, the last province to take part in the Dominion highway scheme, has just filed for approval plans for road improvement under the Canada Highways Act. All of the provinces are now working under the general regulations provided by this act, and the work throughout the provinces is being carried out in accordance with uniform standard specifications.

Proposed Standards for Electric Units

Prominent Engineers Discuss Tentative Standards Under Consideration by Automotive Electric Association

Editor, AUTOMOTIVE INDUSTRIES:

I have read with great interest your report of the Old Orchard meeting of the Automotive Electric Association.

It is hoped that the publishing of the proposed standards on generator ratings will draw constructive criticism from all those interested, so that when the Association finally adopts the generator and motor ratings which are to be followed, they will be standards in every sense of the word.

Last spring, before the meeting of this committee at White Sulphur Springs in June, the entire industry was circularized by S.A.E. headquarters as to the use of generator and motor mountings which are now in the S.A.E. Handbook as standards, and it was found that the use of these standards was a surprisingly low per cent of total. It is believed that after the A.E.A. Standardization Committee has had a chance to consider and digest the report of the S.A.E. Standards Committee, that a joint conference of our Standards Committee with the S.A.E. and executives and engineers of car manufacturers will prove of great value in determining what is to be done with standard methods of mounting motors and generators.

It is of interest to remember that the very first electrical standard adopted by the S.A.E. is still in use substantially unchanged. I refer to mounting dimensions for magnetos.

So far as I can see, there is no reason why standards cannot be adopted for at least 75 per cent of total production. I sincerely hope that your journal will continue to give publicity to these matters in order that the greatest good may be derived therefrom.

A. D. T. LIBBY,
President, Automotive Electric Association, and
Patent Counsel, Splitdorf Electrical Co.

Editor, AUTOMOTIVE INDUSTRIES:

I have given careful consideration to your article on the standardization program of the Automotive Electric Association and offer the following comments regarding the proposed standardization of generators and starting motors.

In order to arrive at a set of standards on electrical units which will be of mutual advantage to the automobile manufacturer and the producer of the electrical equipment, it would appear to be necessary to formulate a set of skeleton specifications which would insure not merely a satisfactory bench performance but also good service in the hands of the user. That is to say, I would like to feel (assuming that this proposition goes through) if I was approached by different manufacturers with a view to purchasing, say, their No. 2 S. A. E. standard generator, that these generators would give something like the same result in respect to such important factors as heating and brush life. I realize, of course, that, in formulating standards, it is desirable to make them as broad as possible, but it is also highly desirable to impose such restrictions as will prevent one manufacturer obtaining an unfair advantage over another due to the absence of such a controlling specification, for example, as would cover the temperature rise of the generator. I would, therefore, suggest that the standards include some reference to temperature rise for all sizes and, if possible, some reference to minimum brush life which, to my mind, should be in the neighborhood of 25,000 miles.

As regards the proposed standards on starting motors, the chief obstacle, to my mind, is represented by differences in pinion sizes recommended by different manufacturers. In other words, a starting motor with a 10-tooth pinion and a 10 foot-pounds stall torque should be just as satisfactory as a starting motor with a 12-tooth pinion and a 12 foot-pounds stall torque. It would appear to be detrimental to progress to standardize on any minimum number of teeth in the pinion for each size of starting motor, so this leads to my conclusion that for the present it might be more desirable to merely standardize on a set number of starting motors to cover the range of engine sizes in common use. For example, some such schedule as follows:

No. 1—up to 180 cu. in.
No. 2—180 to 300 cu. in.
No. 3—300 to 500 cu. in.
No. 4—500 to 1000 cu. in.
No. 5—1000 to 1500 cu. in.

Of course, these different classes would overlap, to a certain extent, depending upon the number of cylinders and many other considerations.

I believe that all efforts toward standardization along the proposed lines are highly commendable and I will look forward with considerable interest to the further progress of this work.

J. G. VINCENT, Vice-President of Engineering,
Packard Motor Car Co.

Ninety per cent of the farmers who responded to a survey made by the United States Department of Agriculture state that the factor of time saving is the greatest advantage of trucks over horse-drawn vehicles. Even on short hauls the motor truck requires only about half the time needed to make the same trip by wagon.

Automotive Industry Can Avoid Ills of Secondary Inflation

Conservative expansion policy essential to sound progress. Limit plant expansions to demands of normal growth curve. General deflation not likely to be entirely completed within twelve years. Past deflation records worth serious study.

By Harry Tipper

BETWEEN the Civil War and the World War, industry in the United States had seen the greatest period of its development. It had become highly specialized, complicated, subdivided, so that nearly every product necessary to the individual was manufactured by a special industrial section, with its complicated process of manufacture and systems of distribution. In this matter of complication and interdependence, the industrial fabric of 1914 represented a greater development over the fabric of the Civil War, than that system represented over the beginning of the century.

The disturbance of war, therefore, profoundly affected the entire living of every family within the borders of the United States. The removal of men from the normal pursuits of industry for active warfare and the segregation of many more to the industrial necessities of war, made the normal life of the previous few years impossible. With such an interdependent system, every citizen was obliged to concentrate a part of his activity on war needs, whether consciously or otherwise. Consequently, the rise in values, owing to the scarcity of commodities, was sharper and continued for a longer period. Some check was placed on this during the war, so that the peak was not reached until the war had been over for two years.

Under these circumstances it is not likely that the deflation processes will be less difficult, or occupy less time than the twelve years required after the Civil War. The disturbance was profound; it involved the national and the important international developments of industry. It carried with it political changes far more important than the previous conflicts, and it affected the activities of a large part of the population to such a degree that the results will be many years in accumulating.

The deflation processes, therefore, are likely to occupy some years and to be separated by periods of secondary inflation. If they follow the conditions to be observed after the Civil War, they will require a much longer time for their final settlement and they will be divided into a larger number of periods, with the intermediate inflation separating these periods from each other.

The deflation which began in the latter part of 1920 has carried us only about a third of the way down the path up which we climbed so rapidly in the rush of war necessities. This period is almost over. In some lines of industry it is over. In other lines it must continue for several months at least before it can be considered as finished. It is obvious, however, that this period has not completed the process of deflation and that further struggles are before us, unless the entire lesson of previous history during the mechanical age is of no moment.

PRESENT business conditions bring to mind the advice given one time by a very shrewd and successful Scotch business man. Discussing expansion plans he remarked:

"It is well to figure pessimistically and then act optimistically and courageously on the basis of the calculations."

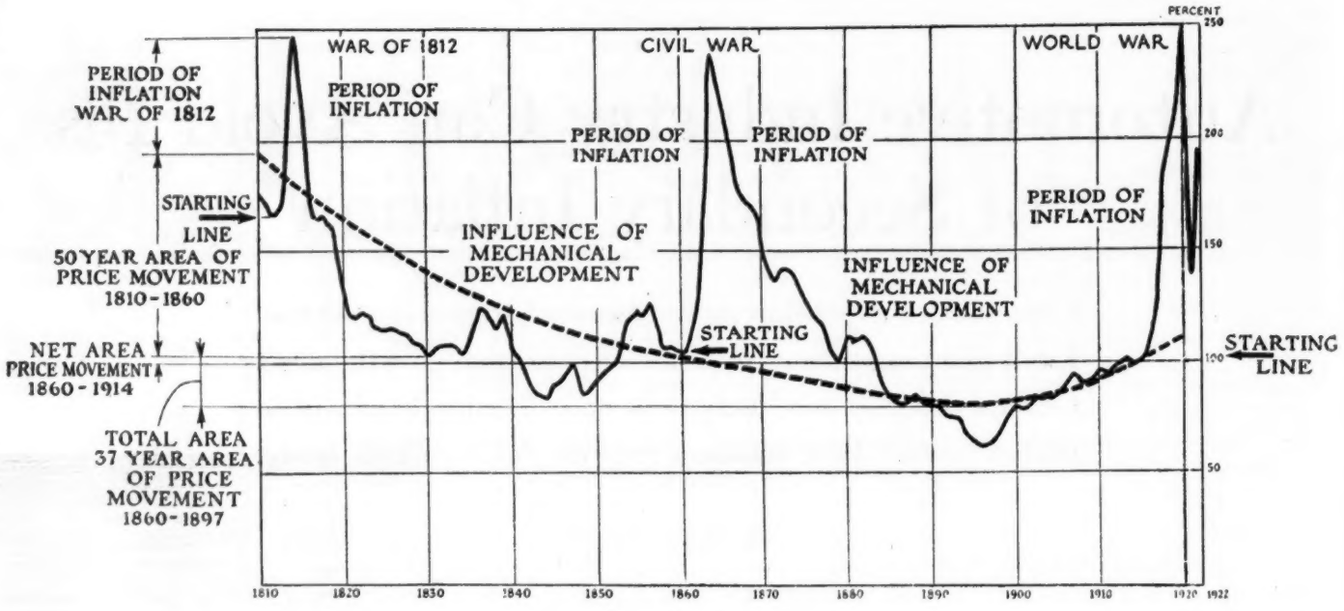
The automotive industry has an opportunity to escape from some of the worst effects of the deflation process, if it does its figuring conservatively and acts without hesitation after the figuring has been completed.

The automotive business suffered less from inflation than many other lines.

This was because it had not reached the same stage. of development and was less affected by the immediate economic changes. The unit system of self-propelled transportation was so important a necessity to our business and social life that it was still in the absorption stage of growth when the war developments came along. Its activities in the war, therefore, delayed the process but did not lead to any such abnormal development of production as affected some other manufacturing industries.

Business men have been unable to understand the vitality of the automotive business during the period of depression, when many other lines of industry were virtually at a standstill. They are similarly confused by its rapid resumption of capacity business, while they are having a difficult time to keep themselves intact during the doubtful hand-to-mouth business which still obtains with them. The reasons for this condition are plain, if the economic situation affecting the business is thoroughly understood.

This makes it all the more important for the automotive manufacturer to study the reasons and to be sufficiently familiar with the surrounding business conditions so that he will not be misled by the buoyancy of this industry into thinking that it is not subject to the same economic laws as other lines.



A century of price cycles

There need be no secondary inflation in the automotive business, following this period of deflation, unless the automotive manufacturer is hurried into extensions of production, which are not justified by the circumstances and are brought about by confining his examination to the comparative condition of this industry during the last two years.

The present shortage in manufacturing facilities, which makes it impossible to deliver automotive products on time to the user, may be due to a manufacturing capacity too small for the permanent normal requirement. The present situation does not, however, indicate such a condition.

Undoubtedly, the market for automotive products will be generally upward for some years as yet, and in the course of time many additions will be necessary to secure the full production requirement. The probable imminence of a period of secondary inflation generally in industry in this country would argue the wisdom of limiting extensions to such absolutely necessary developments as are well within the normal curve of requirement.

The area of most intense competition occurs when the production capacity is somewhat larger than the immediate requirements of the market. The automotive industry has escaped a large part of this competitive difficulty, and it will be possible to continue without inviting that necessity if extensions in production capacity are considered with thorough conservatism.

In the Dec. 1, 1921, issue of AUTOMOTIVE INDUSTRIES there was published a chart showing the changes in wholesale commodity prices for somewhat over a century. At the time this chart was used to suggest the increasing importance of marketing and distribution costs. The same chart is used in this article because of its significance in the examination of the factors of inflation and deflation.

Deflation After 1812

This chart includes the period of the War of 1812, the Civil War and the World War to the summit of the inflation peak. By an examination of the inflation and deflation processes, it is possible to get some idea of the conditions which will obtain in all probability in this period.

The War of 1812 shows a very rapid inflation to about 1814 and an equally rapid deflation ending about 1816. There was only one period of deflation which occupied a very short time and which brought the general price average down to the prices obtaining before the period of inflation induced by the war. From that time the action of prices was governed by the movements of industry in its economic development.

The Civil War shows an entirely different condition in the progress of the inflation and the length of time involved in the deflation process. The length of the inflation line is twice that of the previous war; it reaches its culminating point at the end of the war or somewhat thereafter, and the line of deflation is broken by secondary periods of inflation, so that it occupies a number of years. There was a sharp deflation in the period from 1865 to 1868, followed by a year and a half of almost stationary conditions, another period of deflation ending in 1872, a year and a half of secondary inflation and a further drop completing the process by about 1877.

Economic System Simple

The War of 1812 affected the industrial fabric of that time, so that the period of inflation caused by the emergencies of the war lasted about the same length as the period of deflation occasioned by the return to peace. The machinery of manufacture and distribution was simple, the average community almost self-supporting, consequently the disturbance caused by the war was eliminated with the same ease that it was accumulated. There was no long period of adjustment with its difficulties and dangers to the individual business man. When the hazards of war were removed and the population returned to peaceful pursuits the lack of product and the damage to the system were repaired within the same period and with no after effects.

After the War of 1812, the complication of the machinery of manufacture began. The steam engine in the mill, the railroad train and the steamboat made a revolution in the industrial processes which had secured a fair start before the Civil War again disturbed the machinery of commerce. The community life had begun to change in response to that development. The various communities were no longer almost self-supporting. From the older industrial country of Great Britain manufactured commodities were beginning to take the place of the home-made variety. The production of food, the development of raw materials and the transportation of commodities was taking on a more highly specialized form.

Consequently the disturbance caused by the Civil War resulted in an entirely different condition of inflation and

deflation. The war emergencies affected more deeply and more seriously the life of all communities. The removal of large areas of land and great armies of men from the ordinary work of the specialized occupations left these activities without any possibility of immediate recovery. The products for the use of the civil population became scarcer, the line of inflation rose more sharply and to a greater degree from the average previous level.

A similar situation confronted the country after the war was over. The more complicated machinery of industry could not be repaired and made effective as readily. The man power could not be distributed so as to bring back an equilibrium as quickly. When industry did settle down, whole areas had changed in their potentiality and possibilities. The period of deflation was longer, broken into three distinct parts with secondary inflations, occupying from one to two years each.

The difference could be illustrated by the effect of a strike at this time and one in any fabricating area in the early part of the nineteenth century. The grim possibilities involved in the recent strike of the coal men are sufficiently in mind to need no emphasis. The whole industrial fabric of the country was on the verge of stagnation, the whole social life near disaster when the strike was settled. If the strike had been continued much longer the hardships involved would have affected the whole country and taxed the ingenuity of the best minds to avert. In the early part of the nineteenth century, when every fabricating area secured its own fuel at its doors, no such result was possible. Each area was almost independent of the other, and any dispute or disturbance was confined within the actual area of that disturbance, without materially affecting the conditions in any other part of the country.

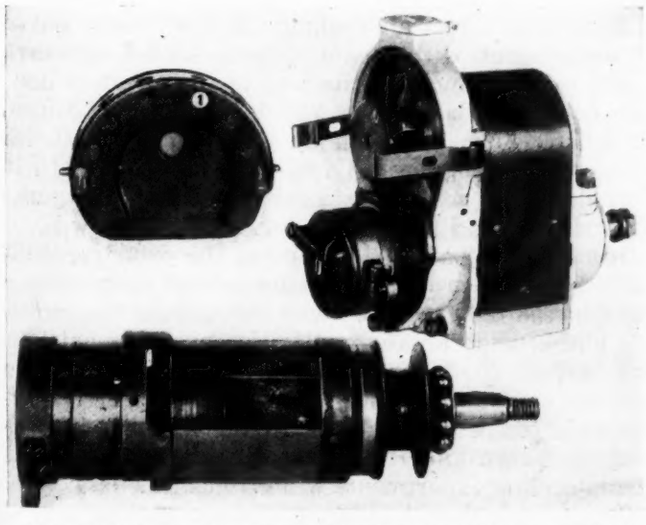
The chart will show that the war just over produced a longer and sharper line of inflation than either of the other conflicts included in its consideration.

A New Magneto for Six-Cylinder Engines

A NEW high tension magneto for six-cylinder engines, which weighs only 10¼ lb., is now being marketed in this country by the Robert Bosch Magneto Co. It is known as type ZH6 and was designed originally for use on aircraft engines, but is well suited for other automotive applications, especially in the passenger field.

Aside from its compact design, the feature of particular interest which differentiates this magneto from others of the same make is the use of a magnet field sleeve which is attached to and moves with the interrupter housing. This sleeve is interposed between the field magnets and the armature, and being made of magnetic material, so diverts the magnetic field as to give approximately the same flux and consequently the same spark intensity throughout the timing range, which in this instrument is 40 deg.

In general construction the magneto follows that of other products of the same make. The breaker design is the same as that used for many years. No die-castings are employed. The base is an aluminum forging and is smaller than the S. A. E. standard base, although the magneto can be mounted on the same brackets by drilling two extra holes or using only the two bolt holes nearest the tapered shaft end, since these holes are the same distance apart and the same distance from the end of the taper and the shaft height is the same as the S. A. E. standard. The taper on shaft end is 1 to 5.



New Robert Bosch magneto showing the field sleeve which surrounds the armature

The magneto is fitted with Norma ball bearings, one of which is carried within the magnet field sleeve. It is of waterproof construction and is said to be the smallest magneto made to-day for six-cylinder engines.

Cut-Throat Competition of British Air Lines to Cease

A NEW subsidy scheme for Continental air services worked by British companies has been evolved by the Air Ministry whereby it hopes (1) to put these services on a paying basis when assisted by the subsidy allowances, (2) to encourage the extension of traffic, and (3) to cause British services to penetrate farther afield. It has decreed that unprofitable competition shall cease between the various British companies, and has decided that in future each one shall be allowed to operate only on a specified service.

Thus, instead of three British companies working the London-Paris service there will be one only, the other two being allocated respectively to the London-Brussels-Cologne route and to a new service from London to Berlin via Amsterdam and Bremen. This arrangement will come in force almost immediately and will be supplemented early next year, it is expected, by a service to be run by a new company from London to Southampton, Cherbourg and the Channel Islands.

The Air Ministry announces that the total amount of the annual subsidy will be as hitherto, viz., £200,000, but that the basis of payment will be changed. Up to the present each company has been given an amount equal to 25 per cent of its gross earnings, with additional payments for each passenger carried plus contributions toward insurance and the provision of aircraft. The new scheme provides for a limited cash payment in each case for the completion of a stipulated number of flights and contributions in cash or in kind toward the maintenance of a fleet of approved size and value.

The London-Paris service (225 miles) will in future be worked by Handley Page alone, except for the competition of French air lines; Instone will operate the London-Brussels route with an extension to Cologne (310 miles).

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The Beaten Bonus

PRESIDENT Harding's courageous veto of the soldiers' bonus bill has been given cordial approbation by the press generally and by business interests in particular. It is probable the measure would have had far fewer supporters in Congress had not the President announced months ago that he would not sign the bill unless it provided some acceptable means of raising the enormous sum needed.

By stating his determination in advance, the President made it possible for senators and representatives to give the impression that they were for the bonus, heart and soul, without committing the nation irretrievably to an expenditure which would be suicidal at this time. These members of Congress thought it was good politics to wrap the flag about them and thus win the soldier vote. The chances are, however, that Mr. Harding has won much more respect than they have.

This country is not so poor that it cannot afford to deal generously with the dependents of those who died on foreign soil and those whose earning capacity has shrunk seriously by reason of wounds or illness suffered in the service. There is no excuse for failure to be generous and the country will not tolerate a policy of penuriousness. But there is even less excuse for loading the nation at this time with a terrific burden of taxation for the benefit of those who do not actually need assistance.

It may as well be accepted as certain, however, that the bonus merely has been delayed and not defeated. Some such measure as that just defeated by the presidential veto will be passed sooner or later. But unless some new emergency arises every year of delay will make it less burdensome when it comes.

Cooling Ideals

THE ideal of internal combustion engine cooling is to do away altogether with the need for thus wasting heat. Every particle of energy that goes into cooling air is waste that can never be recovered. The use of higher compressions and, in general, the obtaining of more power from a given piston displacement usually goes hand in hand with improved efficiency of combustion which means less waste.

The ideal is probably unattainable, but progress in its direction may be made; meanwhile there will be increasing competition between the different methods of getting rid of such heat as must be dissipated.

It has never yet been decided how hot an engine cylinder should be for maximum economy, assuming equality in all other respects. The true temperatures of a few engines have been measured, data on air-cooled engines being particularly meager. One thing is clear and outstanding, that whatever temperature is ideal that temperature we should have all the time with perfect automatic regulation of the cooling in proportion to the power output.

At the moment the attainment of really constant conditions appears to be far easier with a steam or vapor system than with any other and to be especially difficult with direct air cooling. A fairly long course of experiment with steam systems under pressure ought to give conclusive data as to the effect of definite degrees of heat above 212 deg. Fahr. Of course such data is not obtainable by simply adapting steam cooling to an engine designed for water, but with it a whole engine could be laid out for a jacket temperature of 250 deg. Fahr. or 300 deg. or what you will.

In developing air-cooled engines the principal difficulty has been in the elimination of hot spots rather than in the temperature mean throughout the cylinder and considerable irregularities probably exist in the best air-cooled engines. Experiment with some gaseous or fluid medium giving even and exactly controllable temperature ought to be valuable in air-cooling design and it is sincerely to be hoped that steam-cooling experiments will give us this data.

In any case the advantages of steam cooling should not be overlooked.

An Opportunity for Truck Transport

By JAMES DALTON

AN exact counterpart of the conditions which resulted in the first real development of highway transport will prevail in the United States in the next few weeks. How long these conditions will continue cannot be determined at this time, but there is little doubt that their duration will be long enough to broaden still further the permanent use of the motor vehicle as a means of transportation.

It should be remembered that the motor truck has been an important element in transportation for only about six years. It owes its present position to the railroads which were unable to handle the enormous volume of freight offered them during the boom from 1917 to 1920.

When railroad congestion became so acute that they declared embargoes and were blockaded for weeks at a time, manufacturers saw they would have to find some new means of transportation or close their plants. They found the answer in motor trucks but expected their use to be only a temporary expedient. These vehicles met the emergency so well, however, that use of them was continued when the railroads finally cleared up the traffic jam after depression strucy the country in 1920.

Merchants and farmers found trucks as necessary as did the manufacturers. They employed them to move merchandise and foodstuffs with such good results that they have continued to use the highways for short haul, less than carload lot shipments.

A. J. Brosseau, a director of the National Automobile Chamber of Commerce, and president of Mack Trucks, Inc., made a prophetic statement in an address before the Shippers' Conference of Greater New York on Jan. 10 last, when he said:

"As you all know, business has been poor for the past year and the railroads can handle all the traffic that offers. We are asked if the railroads are now helped by the motor truck. My answer is 'yes,' for business is going to be good in the near future and, when it is, the railroads will again be unable to handle the traffic. We shall then have delayed shipments, embargoes, blockades and the truck will again save the situation for the railroads and the public. It may also save the railroads from the fate they so narrowly escaped during the last traffic jam—permanent government ownership."

The situation forecast by Brosseau more than eight months ago has arrived. The carriers are getting into a terrible tangle. With a winter chill in the air and coal pockets almost empty, miles of loaded coal cars are standing in railroad yards because there are no locomotives to move them. Rolling stock, already badly worn, is in worse condition than ever because of the shopmen's strike. When the roads are paying refunds every day to passengers on their excess fare trains which are continually running late because of engine trouble, there's no blinking the fact that their motive power is in a bad way.

Freight car loadings, even with the coal movement not yet normal, have reached record proportions. The carriers are doing the best they can under difficult circumstances, but winter is approaching and operating conditions soon will be more difficult. The time is already here when almost a third of the steam generated by locomotives must be used to heat passenger trains.

The consequence will be that manufacturing and mercantile operations must be curtailed unless some auxiliary means of transportation can be found. Resourceful American business men are not going to slow down their business when their order books are full, if they can help it. They have learned that they can rely on trucks in almost all kinds of weather and the tonnage trucked will increase steadily from this time until the railroads straighten themselves out.

Even the carriers' executives will admit, privately, that the carrying capacity of the roads is not great enough to meet the demands of American business in a period of normal prosperity. Even with increased earnings, it would take them a long time to equip themselves with the rolling stock they need.

When that time comes, the motor truck will be so firmly established in the short haul field that it cannot be injured seriously by any propaganda that may be directed against it.

After all, the public and not the motor truck owner or the railroad will determine ultimately how far highway transport is to be developed.

Factory Operations Exceeding Last Year

Various Factors, However, May Keep September from Reaching August Record

NEW YORK, Sept. 25—With a further marked awakening of interest on the part of the farmer, the demand for automobiles, while showing a slight decline in cities, is taking a perceptible swing upward in the agricultural districts. Improvement of general business conditions is equalizing the demand for motor trucks, dealers availing themselves of it as well as beginning to realize on the potential market the farmer offers.

Agricultural interest is most in evidence at the state fairs now in progress in many sections of the country and forms a good barometer of what the industry may expect during the coming months.

Output 25 Per Cent Better

Present indications that September is keeping up with the steady pace maintained since early spring may upset predictions that this month will show the seasonal falling off in sales, as a whole, and with it a consequent curtailment of factory schedules. The first week of the month, for which reports have been received, shows a surprisingly good production record with an output from 25 to 30 per cent greater than for the similar period a year ago. Final reports may show that this percentage of gain has been continued through the entire month.

Although Ford closed his factories for a brief period, all other manufacturers are maintaining production at a high level. Securing coal has not been so serious a deterrent to producers in maintaining capacity schedules as has been the difficulty in getting through steel shipments. Up to this time, however, tie-ups that have come in steel deliveries have been merely temporary and not such as to cause deep concern.

Coal Situation Easier

Several factors will combine to keep production from reaching the high mark attained in August. A short month, the cessation of work over Labor Day and the few days' closing of the Ford plants will effect a reduction in the total output for the month.

A further easing up in the coal situation through the order of the Interstate Commerce Commission abolishing priorities will place the industry in less danger of having to curtail their programs through lack of fuel.

Business in Brief

There are several contributing factors to the noticeable improvement in business generally—strike settlements, cooler weather, the passing of the tariff bill and activity in building. Retail trade and industry both are more active than they have been for some time.

Grain prices have reached the highest level of the month, while there have been several advances in many commodities. Buying at wholesale has been conservative, while some retailers doubt their ability to obtain the higher prices asked in their lines.

Car shortages have hampered coal production and lumber shipments. This is noticeable in the failure of the weekly soft coal output to top 10,000,000 tons, even after three weeks of peace in the labor world.

Buying has been stimulated in steel by the prospects of higher prices, although steel prices are steady and pig iron is higher on the whole.

Frost has not touched the corn crop, but it has been hurt by past heat and drought. Cotton estimates tend downward. Central Illinois reports a large part of the fall plowing done because of a good rain, while the seeding of wheat in the Southwest will be late. The Central West promises an increased acreage.

Car loadings for the week ended Sept. 9 totaled 832,744 cars, a decrease of 98,854. This is 83,192 ahead of the same week last year.

The war scare depressed the stock market. Bonds were irregular but money was firmer, with European exchanges recovering.

Bank clearings for the week ended Sept. 21 aggregated $7,453,174,000, a gain of 13.2 per cent over last week and of 13 per cent over this week last year.

Adding to Lincoln Plant to Increase Production

DETROIT, Sept. 25—Work has been started on a large addition to the Lincoln plant of Ford Motor Co. which is declared to be designed to meet the needs of Lincoln manufacturing. The new building will make possible a large increase in production, but details as to how large this might be were declined. The question if it would reach 100 a day was met with the statement that definite totals could not be told at this time.

In addition to providing for more production, the new plant will take care of a lot of manufacturing which is now being done by outside companies. In this will be included some of the body work, but it was not declared to what extent the company would go in building its own bodies.

Mason Tire Will Ask New Issue of Bonds

To Submit Plan to Stockholders —Refinancing Follows Increased Business

AKRON, Sept. 27—Stockholders of the Mason Tire & Rubber Co. of Kent will have submitted to them for their ratification at a special meeting on Oct. 17 a complete refinancing program which will include issuance of $2,000,000 in first mortgage bonds.

The financing measures contemplated are not for the purpose of getting the company out of hot water and of extricating it from financial difficulties, it is explained by President O. M. Mason, but the company has experienced so healthy a growth during the past few years that new funds are imperative at once to permit a substantial increase in production in order to fill orders without unnecessary delay.

Will Finance Owen Plant

The Mason company recently purchased the plant of the Owen Tire & Rubber Co. at Bedford, near Kent, and now is in production there at the rate of 500 tires daily. Funds derived from the refinancing measures which stockholders are expecting to ratify without a dissenting vote, will be used to complete the financing of the Owen plant, and to increase production there to 1500 tires a day so as to give the Mason company a total daily production of 6000 tire casings.

The capital stock of the company will be increased from 150,000 to 350,000 shares of no par value stock. Part of the funds from the refinancing program will also be used to refund $540,000 worth of outstanding seven per cent serial notes.

Need for additional capital with which to expand is seen, according to President Mason, in the fact that the company in the past three years has tripled its tire production with sales now averaging more than $1,000,000 a month.

Steady Growth of Business

The Mason company was incorporated in 1915. At the close of the second year it had done a business of $1,213,859 for the 12 month period. This was increased to $2,324,144 in 1918 and to $3,464,859 in 1919. The company's business grew rapidly in 1920, approximating $7,150,000 for the year. In 1921 the company reported sales of more than $9,000,000 and net earnings of $600,000.

The company's last annual financial statement showed cash on hand of $240,000, accounts and notes receivable of $1,071,767, inventory of $1,363,458, and plant accounts of $3,395,000. Liabilities listed included accounts and notes payable of $774,619, preferred stock amounting to $6,128,990 reserves of $115,892, serial notes amounting to $595,000, and minor liabilities of less than $100,000.

Chevrolet Will Use Plant at Janesville

Only Part to Be Occupied by Unit —Samson Manufacture to Continue

MILWAUKEE, Sept. 25—General Motors Corp. decided to employ part of the unused capacity of its mammoth Samson tractor plant in Janesville, Wis., to relieve the pressure upon the present facilities of the Chevrolet division at Flint, Mich., and elsewhere.

The Janesville plant, erected during the last four or five years, consists of vast areas for manufacturing and assembling tractors and embraces also one of the largest foundries and steam generating plants in the United States. The project, already representing an estimated investment of nearly $5,000,000, was laid out to cover several more years of construction work, which was intermitted in 1920 because of the general business depression and the sharp decline in tractor trade.

While tractor business is now reviving in a most encouraging manner, the great capacity of the Janesville plant probably would not be fully occupied for some time to come, consequently General Motors will take advantage of the idle capacity by devoting it to Chevrolet production and distribution.

Forerunner of System

It is said that the prospective Janesville Chevrolet division will serve the Northwestern territory, and will be the forerunner of a probable system of branch assembling and distributing plants similar to that maintained by Ford. Chevrolet business has experienced a remarkable increase, especially in the past six to eight months, which demands a very material enlargement of production and more ample means of distribution as well.

In addition to the big machine shops, foundry and other buildings grouped at Janesville, the Samson tractor division of General Motors also owns a large malleable foundry at Waukesha, Wis., acquired at the time the new Janesville plant was being operated at the limit of its capacity on tractors, and construction work, although pushed with every means available, was not able to cope with the production schedules demanded by orders.

Therefore a going plant in proximity to the main works was purchased to get immediate supply of malleable castings. At the time, too, the Janesville plant was intending to engage in the manufacture of tractor implements on a large scale.

Tractors to Be Continued

DETROIT, Sept. 26—Location of a unit of the Chevrolet Motor Co. in a section of the plant of the Samson Tractor Co. at Janesville, Wis., will not have the effect of decreasing the tractor capacity of the Samson company, according to a statement by General Motors Corp. Chevrolet will take over some of the buildings formerly occupied by Samson and will erect additional buildings, but in giving up these plants Samson is moving into new buildings recently completed for its use.

Equipment and stock of the company will be moved from the present assembly building into the new foundry and implement plant. General Motors has no intention of quitting the tractor business, but is taking advantage of the present lull in this business to divert some of its facilities to taking care of the pressing needs of the Chevrolet company.

Farmers Need Cars but Will Be Governed in Buying by Prices of Crops

By HENRY KROHN

Vice-President in Charge of Sales, Paige-Detroit Motor Car Co., Jewett Motors

Detroit, Sept. 25.

THE farm market this fall is not going to run higher than twenty-five per cent of what had been anticipated earlier in the year, and the industry must continue to look to the industrial centers to supply most of the demand for the remainder of the year.

With dealer organizations in the larger cities continuing their sales efforts of the earlier part of the year, the industry should enjoy a very fair and reasonable business in the fall and winter. There is no reason to expect a continuance of the capacity business of the early year. On the contrary, business will taper off gradually until the beginning of the shows.

The farmer has failed to come into the market in anything like the numbers expected because fall prices for his crops have not justified immediate turnover and he is holding until spring. The farmer who normally could afford to buy a car this fall is the farmer who can afford to hold over. We have been advised that farmers in Minnesota have been quoted a price of 60 cents a bushel for wheat on the farm. Farmers can't sell at a price like this and buy cars.

In the fruit growing and lumber sections of the Northwest the railroad situation has stagnated business. Thousands of dollars worth of fruit have rotted for lack of transportation. No freight cars are available for moving lumber and the industry has been compelled to hold up operations until its needs can be met.

Business is showing much improvement in the cotton growing States where there has been a short crop but for which there was a stiffening in price which made it profitable to market. With the resumption of work in the coal mining districts there should be an increase in buying there, but most of the business will continue to come from the city centers and from the western coast.

Automobile credits are not satisfactory in the farming districts and will not be until the farmer sells his crops. Bankers are frowning upon loans to farmers for automobile purchases and are awaiting the liquidation of existing loans before they extend further credits. This situation will be corrected in the spring when the full volume of farmer buying comes through.

There is no question but that the farmer will buy cars, because investigation has shown that he needs them. If his prices are satisfactory he will buy the best car he can afford. If prices are low he will be compelled to hold his choice of cars to low priced ones. Cars now moving into the farm districts are only in from a fourth to a third the number that dealers estimated several months ago.

Used cars are not influencing the market for new cars. There are cases everywhere of dealers who are burdened with used cars but this is an individual matter. There is one aspect of the used car situation which aggravates it at this time of year, this being the tendency on the part of some part payment purchasers to lapse in their payments so that the dealer has to repossess the car and reimburse the finance company. To overcome this the dealer and the finance company should be more careful in extending credits to buyers.

ADDS ELEVEN RAIL CARS

CHICAGO, Sept. 25—The Chicago Great Western Railroad, already operating four gasoline motor driven trains, announces its intention of adding 11 more for daily runs of from 100 to 150 miles in Iowa.

Dunlop Plans Approved by Debenture Holders

LONDON, Sept. 14 (By Mail)—Plans for financing the American business of the Dunlop Rubber Co. are progressing most favorably and it is expected that within a few weeks enough money will be assured to enable the Dunlop Tire & Rubber Corp. of America to go ahead. A representative of the American banking interests is on his way to London to conclude the negotiations.

To accomplish this financing it was necessary to secure the consent of holders of £3,000,000 of debentures to the waiving of the stipulation that the unissued £3,000,000 of similar debentures should "only be used by the company as collateral for securing advances from, or liabilities, whether absolute or contingent, to its bankers." It was necessary to get 75 per cent of these stockholders. This has been done, holders of £2,500,000 having given their consent.

N.A.C.C. Would Halt Stolen Car Exports

Bauer to Appear Before Treasury Department for Bill of Lading Reform

NEW YORK, Sept. 25—Concerted action will be taken by the National Automobile Chamber of Commerce and the insurance companies to break up the practice of shipping stolen cars to foreign ports for resale. With this object in view G. F. Bauer, secretary of the foreign trade committee of the N. A. C. C., will appear before the customs officials of the Department of the Treasury at Washington next week in an effort to get government co-operation.

It is desired that the Treasury Department shall devise some method that will compel the identification of every car, new or old, that may be exported from this country. This can be brought about if the bill of lading contains engine numbers and other identifying characteristics of the car being shipped, such information being sent out to insurance companies, police departments and other interested parties. With this data the exportation of stolen cars could be practically stopped, it is believed. It also would enable the police to run down the shippers of such cars and aid in breaking up gangs.

At the present time it is claimed that many stolen cars are shipped abroad, mostly to Cuba and Mexico. When shipped out in boxes and crates, it is almost impossible to discover make, model or identifying numbers without opening the crate, which is not done now.

The National Automobile Chamber of Commerce is anxious to bring about this reform because it feels that these illegitimate sales in foreign countries give American cars a bad name, for in most cases the stolen cars are in poor mechanical shape. Such practices, it is felt, also hurt American export business. The N. A. C. C. also desires to protect the legitimate dealer as far as possible.

Miller Rubber Declares New Preferred Dividend

AKRON, Sept. 25—The Miller Rubber Co., after having paid its quarterly preferred dividend of two per cent on Sept. 15, has declared a similar preferred divident payable Dec. 1 to stock of record Nov. 10.

In addition directors of the company have duplicated their action of September in declaring another 1 per cent dividend applicable to the deferred dividends on preferred stock. Miller, prior to resumption of preferred dividends, had deferred payment of six quarterly dividends, making 12 per cent in arrears. With the payment of 1 per cent in September and declaration of another 1 per cent payable in December on these deferred dividends, the company will only owe its preferred shareholders $10 a share.

Miller production is heavier than ever before in the company's history according to Jacob Pfeiffer, president, tire output exceeding 6500 casings a day.

William Pfeiffer, treasurer and general manager, sailed Sept. 22 for an extended survey of economic conditions in European countries.

LATVIA HAS $70,000 FOR TRACTOR BUYING

WASHINGTON, Sept. 26 — Trials of tractors, among them being four of American make, has convinced the Latvian Government that they are of special value in plowing the devastated districts and fields in many instances overgrown by underbrush. It is estimated that there are more than 1,000,000 acres of such fields on which tractors might be used to great advantage. The shortage of horses also makes the use of tractors particularly advantageous.

The Government, according to Consul John P. Hurley, Riga, Latvia, in a report to the Department of Commerce, announces that it proposes to spend 17,000,000 rubles or the equivalent of $70,000 in the purchase of tractors. A demonstration of four machines from America, four from Germany, and one each from England, Finland, Sweden and Italy has been held. All of the machines, except the "Kosts," were kerosene burners.

Maker of "Accuratime" to Enter Piston Field

MUSKEGON, MICH., Sept. 25—The Muskegon Motor Specialties Co., which for some time has been exclusive manufacturer of camshafts under the trademark "Accuratime," is about to enter the piston field. This company will specialize on lightweight, cast-iron pistons.

According to F. C. Whitney, general manager, an investigation of the field has been made showing that several manufacturers are buying piston castings at one point and shipping to another point for machining and then reshipping the finished products for assembly in the engine.

The pistons will be both cast and machined in Muskegon, and this centralization, it is claimed, will result in a considerable saving in freight and, consequently, handling costs to the engine manufacturer.

The Muskegon company has about completed its tooling operations for production and will be turning out pistons by Oct. 1. The sales will be directed by A. W. Lines, who, for the past three years has been sales manager of the Spencer-Smith Machine Co., Howell, Mich. Carl Kopanka will have charge of manufacturing.

Material for Cars Ordered Far Ahead

Manufacturers Seek to Escape Effects of Expected Transportation Shortage

NEW YORK, Sept. 25—Manufacturing activities among the makers of parts and accessories continue at a pace that surprises even the optimists. In many cases September business is better even than August and there seems to be no immediate lull in sight.

Business is, in fact, much better than had been expected for this time of the year and the parts makers are gratified with the volume. Few complain of a let-up in orders and most of them say that passenger car makers are ordering for longer periods, whereas formerly they contented themselves with buying as they needed the materials for immediate manufacturing. In several instances these orders which are now coming in extend well into next year.

There are some who say that this exceptional fall activity is caused by car manufacturers expecting a transportation shortage later on and so are loading their shelves with materials in order to get by this period of inactivity. There seems to be a well grounded fear that the country is in for a bad spell with the railroads.

Immediately ahead there promises to be such a shortage of freight cars that the automobile industry is taking every precaution possible to offset its ill effects. Crop movements require the use of so many freight cars that industry as a whole will feel the effects of it and when the weather turns it is feared the railroads will be greatly handicapped.

New Company to Build Ogren Car, Commander

NEW YORK, Sept. 25—The Commander Motors Corp., with headquarters at 49 Wall Street and a factory in Chicago, is the successor to the H. W. O. Motors Corp. of Chicago. It will build the Commander, a $5,000 car designed by Hugo W. Ogren, at one time head of the Ogren Motors Co. of Milwaukee.

The officers of the new company are: Charles H. Wilcox, president; Nicholas Schmidt, vice-president; Hugo W. Ogren, vice-president and general manager, and Sidney R. Flett, secretary-treasurer. K. W. Zoeller is sales director.

The company is capitalized at $2,000,000, all common stock, of which $1,500,000 has been placed on the market. C. F. Buman & Co., who are financing the proposition, claim to have placed $250,000 of this with which manufacturing operations will start.

The Milwaukee plant will be used until the factory at Chicago, occupying 40,000 sq. ft., is completed. It is expected that the Chicago works will be in operation by the middle of November.

Milwaukee Reports Much New Business

Will Keep Factories Busy for Month or Two—Plants Keep at Capacity

MILWAUKEE, Sept. 25—Production of passenger cars in Milwaukee and neighboring centers is going forward practically at the capacity of factories reached at the height of the season, the high rate being required to fill orders already on the books and current requisitions from distributors and dealers. Most factories have not yet caught up with dealers' orders, although this refers mainly to closed types. New business is coming at a rate to keep factories busy from 30 to 60 days forward, and with another good month for retail selling in the foreground, it is believed that this condition will obtain until the holiday vacations.

Peak Not Previously Reached

In the case of several factories not the maximum capacity was employed at the peak of the early summer rush, due to a number of reasons. One is that competent labor was not available up to capacity, and another is that some were satisfied to keep inventories well balanced to avoid a possible contingency of a sharp let-up, which has occurred in the past, but fortunately was not the case this year. Such factories, however, have been able not only to maintain their peak forces of this year, but many of them have been adding men as competent help was available.

Manufacturers of parts and equipment as a rule are sustaining production at the recent high point. Makers of equipment for the jobbing trade are busy filling current orders and are not able to make much headway on reserves for winter and spring deliveries, booked or in prospect.

Tractor Trade Improves

Tractor business is steadily coming back to a more nearly normal basis. The John Lauson Manufacturing Co. at New Holstein, Wis., for instance, is now employing over 200 men on tractors and farm gas engines to fill orders actually on the books. Lauson distributors in various parts of the country report business improving rapidly and the outlook good.

Tire factories during the past month increased operations about 10 per cent on the basis of an increase of 15 per cent in volume of sales within the same period.

The virtual end of the railroad shop crafts strike, with which reference to Milwaukee has resulted in manning the large shops to normal, together with the previous cessation of labor hostilities in the coal mines, is slowly showing a beneficial effect, although it will take some time for railroads to get back into their accustomed swing, and for the coal movement to grow to reasonable proportions. In any event Milwaukee, the principal distribution point for coal to the Northwest, will be far short of requirements, for it is a physical impossibility to bring the movement, in the time available for Great Lakes shipping, to a point where the sharp falling-off during the strike period is compensated for.

Milwaukee industries, however, do not believe they are going to suffer radically during the coming winter. The anthracite shortage will be by far the worst evil. Hydroelectric power, supplementing steam generation, is available in fairly liberal quantities; in fact, a great many of the shops making automotive parts and equipment are and have been buying current, although some of the larger plants, of course, maintain their own plants for power and heating.

Although the matter of retail passenger car trade some time ago underwent a conversion from filling a demand to that of selling merchandise, the sales volume so far in September has been relatively excellent.

CLEVELAND EXPECTS COAL TO BE CHEAPER

CLEVELAND, Sept. 25—Automobile manufacturers in this city have taken a prominent part in bringing down the price of coal at the mines in Ohio from $6 and $7 a ton, when the strike of miners ended, to $4 and $4.25 per ton. A lower price is expected.

Cleveland's largest automobile factories are not dependent on coal for fuel. They purchase electric power. All of them require coal for heating plants, but they are so situated they can wait for a lower market.

Steady Demand Will Keep C. G. Spring at Capacity

KALAMAZOO, MICH., Sept. 25—With several hundreds of thousands of dollars in orders booked and a large number of inquiries daily, the C. G. Spring Co. expects the satisfactory rounding out of a busy and prosperous year. The Kalamazoo plant will be required to operate steadily at full capacity to keep up with the demand for bumpers.

This condition was disclosed at a conference of branch managers, in charge of Christian Girl and Fred A. Cornell, new sales manager of the company, who resigned as branch manager of the Studebaker Corp. at Omaha, to accept the local position.

Girl reported that the largest individual contract held during 1921 to 1922, and amounting to over $350,000, has been renewed for another two years, with the announcement that it will likely run to over $500,000 annually. In addition the C. G. Spring Co. also has several contracts with some of the largest producing companies in America.

Indianapolis Plants Moving on Up Grade

All Manufacturers Increase Production—Scarcity of Labor Still Experienced

INDIANAPOLIS, Sept. 23—September promises to be the best production month in the motor car field that Indianapolis has had this year. Practically every local plant is increasing production, adding to its force of laborers and making larger shipments than has been the rule up to this time.

Marmon is about at the best production and shipment records of the year. Stutz is increasing rapidly and hopes to be at maximum production within thirty days. Cole's August record which was far ahead of anything the plant had done during 1922 is being hard pushed.

Increases Personnel

National is increasing the personnel of the plant, and production is ahead of earlier records established during the summer. H. C. S. is also gaining, while Lafayette, which is to be moved from this city, has been increasing its employment rolls.

Earlier in the season one factory or two or three at a time made good records, but this is the first time when all the plants seem to be on the upgrade and shipping vehicles at a good pace. Difficulty in obtaining workmen in certain lines is being experienced in some plants, which adds its eloquent confirmation to better production all around. The labor shortage does not seem to be confined to this city, for several car and accessory plants in other parts of the State are advertising in local papers for additional men. Studebaker and Maxwell are prominent in this connection.

Oakland Motors Output Has Reached 150 Daily

PONTIAC, MICH., Sept. 23—In spite of some difficulties with transportation and securing supplies of materials, the Oakland Motor Car Co. has been increasing its schedule this month and reached the 150 daily output point within the past week. The output of both open and closed jobs is being raised to meet orders on hand. A comfortable margin of orders ahead is reported, although no effort has been made to get business beyond a 30 day delivery period.

Coal supplies have not bothered the plant particularly and no danger of a shutdown on that score has threatened since the settlement of the strikes. There is no likelihood of any tie-up unless there should be unexpected difficulty in transportation. Restoration of full passenger service on the Grand Trunk lines entering Pontiac is taken as a hopeful sign with regard to freight transportation also.

Profit on Each Ford Sold Placed at $100

Daily Earnings Estimated at $500,000—Cash in Bank Totals $180,000,000

NEW YORK, Sept. 25—An analysis of the Ford Motor Co., made by Dow, Jones & Co., has been circulated in the financial district, showing that Henry Ford earns $500,000 daily. With $180,000,000 in cash, Ford's fortune is the greatest in the world, it is pointed out, and he is the largest individual banker in America. The statement claims that the Ford company could be capitalized at $2,000,000,000 and pay 5 per cent. For 1922 it is predicted Ford's profits will be $125,000,000, and it is said a profit of $100 is realized on each car sold.

Continuing, the statement says in part:

In his newspaper interviews Ford says Wall Street and the gold standard have outlived their usefulness, but his millions flow through Wall Street at 4 per cent to bring his company a possible $7,200,000 gold standard money annually in interest. This is more than $6 for every car he produces.

His replacement parts business is so profitable that he could chop off his manufacturing profit of probably $80 a car and make more than $15,000,000 annually or more than $14 on each car produced from the sale of parts necessary to keep the millions of Fords now on the roads in running condition.

D. T. & I. Operates at Loss

DETROIT, Sept. 26—The Detroit, Toledo & Ironton, Ford's railroad, showed a net operating loss of $16,367 for July. This is the second deficit incurred within eight months. Gross operating revenues fell ten per cent from June.

This slump cannot be laid to the shopmen's strike because the management had an individual agreement with the employees. It appears rather that when maintenance expenses should have been high they were reduced and consequently equipment and way required repairs. Equipment expenses increased nearly 200 per cent over 1921 in May, more than 150 per cent in June and 175 per cent in July.

Gill Battery Co. Handles Sales on Pacific Coast

SAN FRANCISCO, Sept. 25—The Gill Storage Battery Co. with factory and general office at San Bernardino, Cal., has awarded the rights to manufacture and distribute the battery in the Pacific Coast territory to a newly formed corporation, the Gill Battery Co. of California.

The new company, which is capitalized at $1,000,000, will erect a modern factory at Oakland, the plant to be in operation probably in the early part of 1923. The original company will continue to operate from San Bernardino and handle its business in states outside of the limits outlined for the coast corporation, which include California, Oregon, Washington, Nevada, Utah, Idaho, Arizona, Hawaiian Islands and Mexico.

The Gill Battery Co. is formed for the purpose of pushing the product on the Pacific Coast where its efforts will be concentrated. A development of the future will be the placing of plants in the East and in Canada, where the original company also has patent rights.

J. & B. Injunction Suit Against Rico Settled

PITTSFIELD, MASS., Sept. 25—A bill of stipulations has been filed in Superior Court here in the case of the J. & B. Manufacturing Co., against the Rico Ignition Co., both of this city. Suit was brought to restrain the Rico company from advertising and selling a spark coil alleged to be so similar to a J. & B. product in appearance as to constitute unfair competition.

In the bill of stipulations it is agreed that Rico shall place distinctive markings on its product and paint it a different color. It is also stipulated that a bill dismissing the case without costs be entered and that charges made by plaintiff and respondent involving bad faith, unfair competition, and so forth, are withdrawn. It is understood that the final decree embodying the terms of this agreement will be entered shortly.

Rail Head Urges Roads Give Detroit Car Supply

DETROIT, Sept. 26—An appeal to "save the automobile industry and its workers" has been made to John C. Roth, director of the Interstate Commerce Commission, by Frank H. Alfred, president of the Pere Marquette Railway.

Alfred suggests that the railroads use automobile cars as far as possible for shipments to Michigan and thus make cars available for the automobile industry. He desires all carriers to use box cars, so that any surplus may be used by the industry which at present is suffering a shortage and may have to curtail production on that account.

The industry is entitled to every consideration possible without injustice to shipment of priorities, Alfred says, because that section of the country depends on the automobile business for its prosperity and will suffer greatly this winter if unemployment results.

COX BRASS GAINS

ALBANY, N. Y., Sept. 25—The Cox Brass Manufacturing Co. reports a 60 per cent increase in business during the year ended Aug. 1 in the sale of bumpers, mostly through dealers and distributors of passenger cars. Ground has recently been broken for an addition to the Albany plant, to be finished Jan. 1, which will double the capacity of that factory.

Additions also are being made to the Cleveland plant, largely increasing its production facilities. The Chicago service station has been enlarged and equipped to function as an assembling and finishing plant.

Attacked Industry, Now Seeks Its Help

Southern Pacific Railroad Petitions for Aid, Fearing Divorcement of Lines

LOS ANGELES, Sept. 21—A somewhat unusual situation has developed in this state due to an appeal being made by the Southern Pacific Railroad Co. to the various motor car dealers' associations asking that the latter, by resolution, go on record and support the petition of the Southern Pacific that action on the divorcement of the Southern Pacific and Central Pacific Lines ordered by the Supreme Court be held in abeyance until after the Interstate Commerce Commission shall have opportunity to hold another hearing.

Employees of the Southern Pacific Lines recently went on record as petitioning merchants of the state to refuse to patronize motor truck freight lines and to use their influence with the public as against patronizing motor stages. On protest of the motor car dealers, the Southern Pacific instructed its organized employees to withhold further agitation of their proposals.

Personal Appeal Made

The Southern Pacific Railroad is now, in its time of trouble, appealing to the motoring interest for help, when only a few weeks ago railroad employees were attacking the business of the motor industry.

D. W. Pontius, general manager of the Pacific Electric Railway, subsidiary of the Southern Pacific Railroad, appeared before the Motor Car Dealers Association of Los Angeles a few days ago and asked that body to lend its support to the railroad's plea. It is probable that in view of the changed conditions and the attitude of the railroad interests the dealers' association will accede to the request, but action was deferred until after such a time as opponents of the Southern Pacific's proposal can present their argument.

Hydro-United Resumes Following Court Action

PHILADELPHIA, Sept. 25—The Hydro United Tire Co. resumed operations to-day at Pottstown, according to Receivers John P. Hill and Ephraim Lederer. The resumption means a minimum production of 600 tires daily and employment of 300 men.

The United States District Court of the Eastern District of Pennsylvania previously granted a petition of the receivers, approving an agreement and stipulation between them and the National Iron Bank of Pottstown and its associates, whereby the bank will extend payment of $57,457 for a period of sixty days and likewise will grant an extension of the indebtedness of $140,000 for a period of ninety days.

Nobile to Supervise Goodyear Dirigible

Italy Grants Him Leave of Absence—Work on Ship Already Started at Akron

AKRON, Sept. 25—Umberto Nobile, Italy's leading aeronautical authority and the co-inventor of the semi-rigid type of lighter than air ship, will come to Akron, Oct. 1, to assist personally in supervising construction of America's largest semi-rigid dirigible, which will be built by the Goodyear Tire & Rubber Co. Nobile is managing director of the Italian government's aircraft factory near Rome and has been granted a three months' leave of absence to permit his work on the new American dirigible.

Will Be Mother Ship

Work on the new semi-rigid ship already has started at the Goodyear aeronautical factories. The ship will be the first "Mother" dirigible to be constructed in the world. It is given that name by reason of the fact that it is designed to carry airplanes which can take-off for flight from the mother ship while the big dirigible is in full flight itself.

The ship will be 300 feet long with a metal keel running the entire length of the gas bag. The envelope will have a capacity of 750,000 cubic feet of gas. The power cars containing the engines and propellers, and the navigator's car, will be suspended from the metal keel, with the huge bag attached to the keel at intervals of ten feet. Designers of the ship say it will be able to pick up or release airplanes while flying at full speed of seventy miles an hour. The ship will have a cruising radius of 4000 miles and will be the world's largest semi-rigid dirigible when completed.

Dirigible at Lakehurst

The only other larger American ship will be the rigid dirigible, the ZR-1, now being assembled at Lakehurst, N. J., for the U. S. Army. This ship will be 630 feet long and will contain twenty individual compartments for gas ballonets or containers. The containers will have a total capacity of 2,250,000 cubic feet of gas. They now are being made at the Goodyear factories here out of rubberized fabric and "goldbeater" skin linings. The largest of these ballonets will be larger than the entire envelope or gas bag of the Government dirigible the C-2 which is now flying to the Pacific coast on the first trans-continental trip ever undertaken on this continent by a lighter than air ship.

REGRINDERS MEET

OMAHA, Sept. 25—The Midwest Regrinders' Association at its second meeting held here outlined a basis for permanent, constructive work on behalf of the regrinders of this section. Regrinders from Nebraska, Iowa and Illinois were present at the convention, and others from Minnesota, Missouri, Kansas and Colorado have signified their intention of joining.

Different departments were organized including membership, selling, production, accounting and adjustments. These departments plan to ask replacement parts manufacturers to co-operate with them in their work. J. J. Fuchs of Omaha is the president of the association.

Aeromarine Ends Season Of Flying to Lake Ports

NEW YORK, Sept. 26—Aeromarine Airways, Inc., announces the closing of the 90 minute flying boat service between Cleveland and Detroit on Sept. 17 after continued operation since July 17.

Two 11-passenger cabin cruisers, making two flights daily between the lake cities, carried 1839 passengers, made 222 crossings of Lake Erie, took 28 charter parties to points on the Lakes and 24 sightseeing flights over Cleveland and Detroit. In addition 2574 pounds of freight were carried, including a Ford roadster, newspapers, magazines, bags and suitcases.

A larger number of passengers were carried in the second month of operation, and the proportion of women fell off due to the fact that business men found the service of increasing value. No forced landings were made; no mishaps occurred and schedules were maintained. This performance compares very favorably to the European subsidized services.

Air transportation will be furnished until after the Pulitzer Race in Detroit, but ships will fly only when demand warrants.

German Points Lesson In "Facts and Figures"

NEW YORK, Sept. 28—Dr. R. Allmers of the Hansa-Lloyd Werke, Bremen, Germany, who has translated the N. A. C. C. statistical review, "Facts and Figures of the Automobile Industry—1921," points out in his preface that the development of motor transportation has played a significant part in America's development and suggests that a stimulation of the industry there would help his country to economic recovery.

He says further:

If one had been more concerned about the United States and known more about its gigantic power, it is possible that things would have been different from what they are now.

Now that the Fatherland is poverty stricken the task for us men of deeds is to build it up again. In this connection it can be of usefulness to know by a closer survey of conditions in the automobile industry that a large field for development is still open to us Germans.

But the statesman also can learn out of this book. He can learn of the great economical significance which this medium of transportation has, despite the fact that such significance is not generally realized; and what he must do in order not to obstruct it, but rather to encourage its development.

Milan Race Winners Identical in Design

Fiat of 122 Cu. In. Displacement, However, Has Six Cylinders; 91 Cu. in., Four

MILAN, ITALY, Sept. 10 (*By Mail*)—American interest in the two long distance races run recently on the new Monza speedway should be keen because of the fact that the major event was for cars of 122 cu. in. piston displacement, the same size scheduled for the next Indianapolis sweepstakes, thus affording a chance to anticipate possible speed results on the Hoosier track next Decoration Day.

Bordino in a six-cylinder Fiat won the 122 in. race at 497 mi. at the rate of 86.89 m.p.h., while the same driver in a Fiat four captured the 373 mi. race for 91 cu. in. cars a week previously at 83¼ m.p.h. While it is doubtful if the Fiats on the Indianapolis speedway could beat Murphy's record of 94.48 m.p.h., it is felt they certainly could equal, if not better, the time made in 1921 on the course in that city.

Engine Difference

In design the 122 and 91 cu. in. Fiats which won are identical, the only structural differences being that the 122 in. engines have six cylinders of 2.5 by 3.9 in. bore and stroke, while the 91 in. engines have four cylinders of 2.5 by 4.4 in. bore and stroke. With two cylinders fewer the hood can be shortened and in consequence the wheelbase is reduced. Many of the parts in the transmission are identical in the two sets of cars; the difference in weight between the 122 in. and the 91 in. cars is only slight.

These cars are the result of three years' uninterrupted work by the technical department of the Fiat company, the men most directly responsible for the success being Chief Engineer Forcana and Avoccato Cavalli, head of the technical service. Signor Cavalli attributes the success not to any one outstanding feature of design, but to a harmonious whole. It is worth noting, however, that Fiat has succeeded in making a successful use of roller bearings for crankshaft and connecting rods where others have met with failure.

Speedway Like Indianapolis

Monza Speedway is a very successful attempt to imitate American automobile track racing methods. Built in a former royal park with the Alps as a background, the Monza Speedway has a unique setting. It really consists of a duplicate of Indianapolis.

Tne full circuit was used for the opening races, but there is no reason why the small circuit, duplicating Indianapolis, should not be used alone. Over the 6⅛ mi. track Monza is slower than Indianapolis, but the 2½ mi. track alone is faster than the Hoosier Speedway.

W. F. BRADLEY.

California Unites to Make Good Laws

Conference Will Have Definite Plans to Submit to Prospective Legislators

LOS ANGELES, Sept. 25—In order to bring about a plan for concentrated effort in legislative matters there has been organized in this state what is known as the California Automotive Conference. This conference is composed of the following seven units: Passenger car dealers, truck dealers, franchised freight haulers, franchised passenger haulers, individual truck owners, fleet owners and motor draymen. Each unit has its committee with a chairman, who is alone empowered to vote.

The conference has been organized for the sole purpose of uniting the interests concerned upon proposed changes in the state motor vehicle laws. In the past, when changes have been advocated or opposed, the legislature has had to listen to claims from so many different sources that nothing but confusion resulted.

When candidates for legislative office this year were approached, they stated their willingness to help the industry if it were united on a definite plan. Numerous problems are involved and to date the conference has held five meetings in the effort to smooth out the difficulties. It was agreed among the various units that whatever decision was reached as advisable for the majority, all would support. This will result in a very much simplified procedure before the legislature, which convenes in January.

New York Association

NEW YORK, Sept. 25—Dealers and dealer association representatives of seven New York State cities met here as guests of the Automobile Merchants Association of New York and discussed a proposal for a state dealers' association. It was decided to call a convention of dealers in Albany Nov. 9 and 10, when a decision will be reached as to whether such an association should be formed.

It was brought out at the meeting that it would be to the advantage of the trade throughout the State to be able to present a united front before legislative and administrative officers of the State on legislative and other questions affecting the sale and use of motor vehicles. It was felt that if dealers throughout the State in sufficient numbers want a central organization, and are willing to finance it, this fact will become apparent at the Albany meeting and plans can then be made to go ahead with the project.

The conference here was attended by representatives from New York, Brooklyn, Buffalo, Syracuse, Poughkeepsie, Utica and Binghamton. C. W. Bull, of Syracuse, acted as chairman of the meeting which was called by Thomas F. Moore, New York secretary.

SAN DIEGO BOY WINS HIGHWAY ESSAY TEST

WASHINGTON, D. C., Sept. 26—The first prize for the best essay on "How I Can Make the Highways More Safe," offered by the National Automobile Chamber of Commerce to the school children of the Nation, was won by 13-year-old Stanley Newcomb of San Diego, Cal. Newcomb won from 400,000 competitors.

The prize winner is entitled to a gold watch and a trip to Washington, all expenses paid, where he will be the guest of the Highway Education Board and the N. A. C. C.

Second prize went to Miss Merlene Beck of Draper, Utah, and third honors to James Gillenwaters of Knoxville, Tenn. Many other prizes were distributed through the different States.

The contest has been beneficial in reducing the number of accidents among children, and a similar contest is being announced again by the Highway Education Board as part of its "Safety Season" for 1922.

Wilson Foundry Expands to Meet Willys Demand

PONTIAC, MICH., Sept. 23—Development of production capacity at the Wilson Foundry & Machine Co.'s plant here to keep up with demands of the Toledo plant of the Willys-Overland Co. is progressing favorably, and the force of men has been increased to nearly 2500. Production is as high as is possible with present machinery and no cessation of orders from Toledo is in prospect.

The expansion began some weeks ago when, after a tour of the plant, John N. Willys gave instructions that arrangements should be made to turn out 300 Knight engines daily for the coming year. At that time the plant was making around 150 Knights daily. Rearrangement of equipment with a view to greater output is practically complete.

New Tariff Law Allows Vehicle to Be Searched

NEW YORK, Sept. 25—Right to search without warrant and confiscate the vehicle if liquor is found is given in Part 5, Section 581 of the new tariff law, it is contended by those who have read the paragraph in question. This is in direct conflict with other laws which do not permit search and seizure of automobiles without warrant, and it is declared that this portion of the tariff law is unconstitutional; that a custom law cannot be enforced when it thus conflicts with the Volstead act.

The tariff clause is intended to give officers of the customs or the coast guard the right to board vessels in search of liquor.

Truck Users Widen Association Scope

Organization in Indiana Is Reorganized and Bars Are Let Down on Membership

INDIANAPOLIS, Sept. 25—Allied Motor Commerce of Indiana, which was organized last fall as a federation of organized trade associations of the state whose members used motor transport, has been reorganized and the scope of its work broadened.

While the federated idea is still a part of the organization plan the new constitution and by-laws make room for the thousands of individuals and firms of the state who employ trucks but who are not members of other organized trade bodies. There is also provision for the membership of those who though not commercially interested in motor transport or highway development are in sympathy with further expansion of the highway building and of greater use of motor transport.

Plan of Organization

The three main features of the policies and plan of the organization are "Public Highway Development," "Fair (Motor Vehicle) Legislative Regulation," and "Reciprocal Highway Courtesy." The body will stand for the idea that the state ought to be vested with the regulation of rates of motor transport to the end that fair treatment will be accorded the transport people, the shippers and the geneal public. Educational campaigns are planned that will make motor transport and its public benefits better understood by the general public.

The advisory board which now controls the organization pending the first annual convention has appointed S. C. Hadden, editor of Municipal Engineering, secretary, and plans a state wide membership campaign in the endeavor to obtain a strong contingent of the body in every congressional district.

LEACH-BILTWELL ELECTION

LOS ANGELES, Sept. 26—New officers and four new directors were elected at the annual meeting of the stockholders of the Leach-Biltwell Motor Car Co. of Los Angeles. M. A. Leach was re-elected president and general manager; S. J. Ulrey of Ontario is first vice-president; Truman Berry of Whittier, second vice-president; and Alfred Ashby, secretary-treasurer. New directors are L. B. Ulrey of Oakland, C. S. Chapman of Fullerton, C. N. Hollingshead of Anaheim, and William Dibble of Puente.

LIGHT MAKER ENJOINED

NEW YORK, Sept. 26—An injunction has been granted the American Lamp Co., manufacturer of the "Yankee" signal, in a suit brought against the D. & L. Manufacturing Co., charging infringement of patent.

Men of the Industry and What They Are Doing

Fuller Back from Europe

Henry J. Fuller of Aldred & Co., also chairman of the Rolls-Royce Co. of America and the Noiseless Typewriter Co., has returned from Europe after a stay of several weeks. He reports that the English Rolls-Royce Co. is operating at capacity and is employing 5500 men.

A. A. A. Promotes Eldridge

M. O. Eldridge, for three years connected with the American Automobile Association, has been named executive secretary of that organization and will have complete charge of the association's work in the United States. Outstanding in the program which Eldridge will endeavor to accomplish will be the development of good roads, with which he has been identified most recently as director of the roads of the three A's. Prior to that he was associated for 25 years with the United States Bureau of Public Roads.

Geisler Manages Gillette Sales

Max Geisler has been appointed secretary and general manager of the Gillette Rubber Sales Co., which has opened offices in Chicago. Geisler has been identified with the tire industry for a number of years and during that time has handled Firestone, Fisk, Columbia and other tire makes. The sales company acts as wholesale distributor for the products of the Gillette Rubber Co. of Eau Claire, Wis. The ultimate aim of Geisler and his associates is to establish a national organization of dealers, taking in the entire country.

Scott Heads Atlas Forge

R. H. Scott, vice-president and general manager of the Reo Motor Car Co., has been elected president of the Atlas Drop Forge Co. succeeding S. H. Carpenter, who died recently. O. C. Hartig has been named a director.

Kennedy in Sales Business

Arthur M. Kennedy, who has been sales manager of the Franklin Motor Car Co. of Philadelphia, has resigned and has established an independent business in sales, research and promotion which is intended to serve manufacturing and sales organizations.

V. C. Kloepper Resigns

V. C. Kloepper has resigned his position as designing engineer with the Dorris Motor Car Co., effective Oct. 1.

Couzens Succeeds Warner

St. Claire Couzens, formerly with the Olympian and Friend Motors, has taken charge of Durant investment sales in Michigan, succeeding Fred W. Warner, former president of Oakland Motor Car Co., who is connected with the New York office of Durant.

Fetterman with Jennings

I. P. Fetterman is now acting as factory representative for the Jennings Corp., Pittsburgh, manufacturers of carbureters.

Ford Returning to Mark Reached Before Closing

DETROIT, Sept. 27—The Ford Motor Co. is working back to a production point which will carry it along at the record capacity mark reached just previous to the closing on Sept. 16. Retail sales of both cars and tractors are reported to be as brisk as at any time during the year, and running slightly in excess of production capacity.

With the exception of one or two bad spots, the demand is general from all parts of the country. Farmer buying is reported to be good, the company not experiencing any falling off because of low farm prices. The bad spots, the company declares, are spots that have been bad all year, but are limited in area and have no important effect on general business in any locality.

Diamond Taxicab Starts Operations in New York

NEW YORK, Sept. 27—The Diamond Taxicab Co., the formation of which was announced in AUTOMOTIVE INDUSTRIES three months ago, has started operations in New York City, its first cab appearing on the streets of the city this week. It has attracted attention by announcing it will operate at 20 cents a mile.

This, it is declared, is the start of operations that will become nation-wide, with a separate operating unit in each of the large cities. The holding or manufacturing unit will have headquarters in New York City, with Mat D. Jacoby, vice-president of the Black and White Cab Co., at the head as general operating manager of the Diamond Taxicab Co.

This manufacturing unit will establish two plants, one at New Haven, Conn., and the other at Jackson, Mich., and expects to make 2000 taxicabs in the next year. There also will be a finance company which will aid in financing each of the local units as well as be of assistance to chauffeurs or owners buying the taxicabs.

The plan of local operation is to sell the taxicab direct to the operator, who will be serviced by the local company in the way of selling him supplies at wholesale rates and furnish suitable garaging accommodations.

Great Britain Field Best, Chrysler Says

Long Time Before Southern and Central Europe Will Be Large Importers

NEW YORK, Sept. 25—Walter P. Chrysler, chairman of the board of directors of the Maxwell Motor Corp. back from a three months trip through Europe, believes Great Britain is the export field which is most promising to the American manufacturer. It will be a long time, he thinks, before central and southern Europe will buy much, although Holland, Belgium and the Scandinavian countries offer some opportunities.

"We are exporting from 2000 to 2400 Maxwells to England and the continent annually," said Chrysler, "and it looks now as if next year we will be able to send over from 4000 to 5000."

Chrysler has not been back long enough to get in direct touch with affairs at the Detroit factory, but he expects to go to the plant the end of this week to look over conditions there.

Willys Manager Here

Sir William M. Letts, managing director of Willys-Overland Crossley, Ltd., came over at about the same time Chrysler did, this being one of his semi-annual visits to the factory at Toledo. Sir William says:

American manufacturers who ship higher priced cars expecting to find a considerable demand are likely to be disappointed. The British public is buying cars like the Overland, Ford and Chevrolet. Trade depression in England, aggravated by the strikes of the engineering trades, interfered severely with the sale of automobiles. There are now unmistakable signs of improvement, especially for the cheaper cars.

Gear Driven Car Added to Kelsey Production

NEWARK, N. J., Sept. 25—The Kelsey car may now be purchased either with the Kelsey friction drive or with the conventional gear transmission. The friction and gear driven chassis are identical, except that the latter, instead of the Kelsey propellor shaft, friction clutch, transmission and rear axle, has a 10 in. Borg & Beck clutch, Detroit three-speed gearset, Standard Parts semi-floating rear axle and Snead propellor shaft. Torque and drive are taken through the springs. The tires are 32 x 4 in. and the gear ratio is 4.75 to 1.

Prices on the gear driven car are the same as for the friction drive models: Five-passenger phaeton, $985; five-passenger sport, $1,185; suburban sedan, $1,450.

SEEKING TO REPEAL WAR TAX LAWS

N. A. C. C. Campaign Is Opened by Hanch

Points Out Inequalities in Letters to Present and Prospective Congressmen

WASHINGTON, Sept. 29—The repeal of the discriminatory war excise tax laws of 1918 and 1921 will be sought by the National Automobile Chamber of Commerce in a campaign, launched here to-day, placing facts and figures before Congress, setting forth the Chamber's argument as to why the laws should be repealed and citing the present inequalities of the existing law.

The opening "guns" of the Chamber are being trained on the members of the House, Senate and more than 1000 nominees for seats in these two bodies.

In a letter, carefully planned by the Taxation Committee of the N. A. C. C., of which C. C. Hanch is chairman, aspirants for Congress and those already in office are asked one question:

Letter Asks Question

"Are you in favor of the repeal of all discriminatory war excise taxes?"

Continuing the letter states:

The desire of Congress to repeal discriminatory war excise taxes was definitely indicated in amending the 1918 Federal tax law by removing such taxes on some articles and reducing them on others. In no case did Congress increase such taxes or add new ones.

The discriminatory war excise taxes in the Federal tax laws of 1918 and 1921, and the changes made in the 1918 law by the 1921 law, are graphically shown in the attached memorandum.

Apparently Congress believed it of greater importance to relieve musical instruments, sporting goods, chewing gum, thermos bottles, fur articles, picture frames, perfumes, toilet waters and hair dyes, than individual transportation. In this belief we do not concur, and we feel that the only equitable thing in the interests of fair play and the welfare of all industry as a whole, is to repeal all discriminatory war excise taxes.

No Special Privileges Sought

The Chamber's letter closes with the request that the addressee favor the Chamber with his opinion in the premises.

The opening "shot" makes it clear that the automobile industry is not seeking any special privileges for itself as an industry, but is merely asking fair taxation on all industry and not the elimination of taxation on certain classes while others must continue to pay the excise taxes.

Under the existing law, section 900 levies a tax of three per cent on all motor trucks, tires, parts and accessories, and five per cent on all other automobiles, tires, parts and accessories.

The law of 1921, repealing in part the law of 1918, relieves manufacturers of musical instruments, sporting goods, chewing gum, thermos bottles, toilet soaps, toilet powders, picture frames, motion picture films, perfumes, toilet water, hair dyes, patent medicines and ice cream from payment of the excise taxes. This the Chamber points out is unfair discrimination against the manufacturers of other, and in the majority of cases, more useful commodities.

Revenue to Government Big

Just what the excise tax means to the automobile industry is seen in the light of Government reports showing that owners of motor vehicles paid into the public federal treasury in 1921 a total of $117,322,000 in excise tax alone, in addition to $212,978,000 in the way of State taxes and $11,000,000 in municipal taxes, or a total of $341,300,000 taxes for the year.

Accompanying the letter and extract of the war excise tax laws of 1918 and 1921 is a vest pocket story of the motor vehicle, showing the census of automobiles by States, the amount of raw materials consumed in manufacturing automobiles and the number of workers employed in the automobile industry.

Success for the campaign against the existing law it is believed by the Taxation Committee of the N. A. C. C. can best be courted by making the broad general appeal for the removal of all excise taxes, and it was decided at the concluding meeting of the committee in New York on Sept. 6 to 7 that the policy would be pursued that was adopted, thus leaving the way open for the support of other industries which feel that they are entitled to a measure of relief from war and post-war legislation.

August Big Month for Makers of Parts

NEW YORK, Sept. 28—In keeping with the production records makers of automobiles are establishing are the reports from members of the Motor and Accessory Manufacturers Association that August is the second best in the last 19 months. It ranks next to May, 1922, and only $646,300 behind in sales. It is the best of any of the summer and fall months by a large margin; in fact it is almost twice as good as August, 1921.

August, 1922, produced sales amounting to $43,053,700, an increase of 5 per cent over July. This month a year ago reported $23,397,640. Collections in August, 1922, are lower than July by 8.21 per cent, $3,705,000 being reported. Outstanding notes amounted to $2,398,350, or 8.15 per cent increase over July.

Will Urge President to Use Tariff Power

N. A. C. C. Wants Executive to Take Action in Cases of Discrimination

WASHINGTON, Sept. 27—Representatives of the National Automobile Chamber of Commerce, acting as the official body for the automobile manufacturers, will go before the Tariff Board next week and urge that steps be taken to secure a lower tariff rate on automotive products from those countries which discriminate against the United States.

The new tariff bill contains a provision whereby the President is given administrative power to increase or decrease the tariff rates to a maximum of 50 per cent in the case of countries discriminating against the United States. It is the bringing into play of this power that the N. A. C. C. seeks.

When negotiations with foreign nations fail to bring about a reduction in their automotive tariff rates or fail to break embargoes, the N. A. C. C. will urge that our tariff rates be raised or similar embargoes be used as a retaliatory measure. In case non-automobile producing countries fail to take favorable action the chamber will ask that the American tariff be raised on certain items of manufacture or agricultural produce.

The N. A. C. C. has always favored lower tariffs on automotive products and the success of its effort to secure them is made evident by the retention of its suggestions in the new tariff bill.

Dividends Declared by G.M.C. Directors

NEW YORK, Sept. 28—Directors of the General Motors Corp., at their meeting to-day, declared the regular quarterly dividends as follows: 6 per cent preferred, $1.50 a share; 6 per cent debenture, $1.50 a share; 7 per cent debenture, $1.75 a share.

These dividends are all payable Nov. 1, 1922, to stockholders of record at the close of business Oct. 9, 1922.

Predicts Good Year

DETROIT, Sept. 26—"The corporation is going to have a very satisfactory year," said C. S. Mott, vice-president of General Motors Corp. "Our units are all doing more than might be expected at this time of the year. The effects of the strikes still are with us, but the fundamentals have been corrected and healthy recuperation is under way. In fact, I might say that never in the history of the corporation have immediate prospects been so promising."

PACKARD RE-ENTERS RACING FIELD

Will Test Out New Theories of Design

Engineering Principles Figure in Decision to Compete at Indianapolis

INDIANAPOLIS, Sept. 27 — The Packard Motor Car Co. will return to automobile racing in 1923 with a factory team, the first of the big factories to engage in the speed sport after once having retired. Incidentally the Packard is the first of internationally famous American factories with big production to engage in racing in the last decade.

This was announced by T. E. Myers, secretary and general manager of the Indianapolis motor speedway, who has been advised by Colonel J. G. Vincent that the Packard team would participate in the eleventh annual 500-mile international sweepstakes race next Memorial Day.

Two Reasons Prompt Move

Colonel Vincent is vice-president in charge of engineering of Packard. He is the co-designer of the Liberty motor and recently won the gold cup at Detroit in the national power boat championship.

The Packard company has two reasons for entering the coming race. The 1923 event will be for cars powered with engines not to exceed 122 cu. in. piston displacement, being smaller than any engine manufactured for production automobiles in this country. European engineers have made rapid strides in the perfection of engines of this size and smaller. The other reason is the national pride of the company.

Colonel Vincent has not given out the details of the construction of the cars but they are now being built by the Packard organization. Three types of engines will compete for the $50,000 purse, four, six and eight. Packard has selected the six for its team because it believes the six will be most efficient in competition in this class. The cars will be one man, with the driver seated in the center. No drivers have been announced.

De Palma Engaged

The return of Packard to racing will revive memories of the Packard Gray-Wolf, which was a sensation 15 years ago and one of the most successfully campaigned cars in the days when the acme of speed competition was achieved on the dirt tracks and beaches. It also will call to mind the work of Ralph De Palma four and five years ago when he successfully campaigned a Packard 12 on the speedways and smashed many straightaway records at Daytona, Fla.

De Palma has been engaged by Packard as a consultant in the building of its team of racing cars for the Indianapolis event of 1923. He is working with Colonel Vincent and the Packard engineering staff in perfecting the design of the cars.

To Test Out New Principles

DETROIT, Sept. 27—The Packard Motor Car Co. is re-entering automobile racing as a means of testing out new engineering principles and theories of design under the extreme conditions which racing presents. The team entered in the 1923 race will drive under the personal direction of Col. J. G. Vincent, vice-president in charge of engineering, who will be in the pits throughout the running of the race. Under his direction tabulation of the data afforded will be accumulated.

According to Colonel Vincent, the changes in piston displacement defined by the race authorities mean a complete revision in designing the engine. The race will be largely a contest of engineering skill, he declared, and companies like Packard should engage their best efforts against those of European countries, that there might be no question of the ability of America to compete with Europe's best.

The qualities of the six cylinder motor will be most strikingly demonstrated in a test confining the engine to a minimum piston displacement, he said. A wealth of engineering data should be afforded by the running of the race under the conditions set, he said, and progress made as a direct result of this which might otherwise not be made without the lapse of considerable time.

OVERLAND DEFICIT GREATER

TOLEDO, Sept. 26—The Willys Overland Co. for the six months ended June 30, reports a net loss from operation of $163,305, but at the same time $6,989,586 was written off for adjustment of investments, commitments and inventories, while the directors also wrote of questionable values and provided for expected losses by suitable charges and reserves in addition to any earlier similar provisions. The result was that with the deficit of $7,924,015 reported as of Dec. 31, 1921, the deficit on June 30, this year, was increased to $15,076,906.

ANDERSON DOUBLES PROGRAM

ROCK HILL, S. C., Sept. 26—The production schedule for the Anderson Light Aluminum Six, originally set at 5000 for the year beginning Oct. 1, has been doubled. The reason for the increase is said to be due to the fact that parts will be more available than was first thought possible, coupled with requests from dealers for increased allotments for this model.

Vote of Motorists Defeats Governor

Show Disapproval of Announced Plan to Increase Tax Burden in California

LOS ANGELES, Sept. 21—The political power and influence of motorists were demonstrated as probably never before in connection with the recent California primary election. Faced by the announced plan of the present administration to increase the tax burden on motorists enormously, the defeat of William D. Stephens, present governor and candidate for the nomination, was accomplished.

Friend W. Richardson, the successful candidate, based his campaign on the policy of an economical administration. He appealed directly to the 800,000 owners of motor vehicles, telling them that if Stephens continued in office they would be called upon to meet heavily increased license burdens and a gasoline tax.

Had to Fight Machine

Stephens had all the influence of a powerful political machine behind him, and his nomination was looked upon as a certainty until the votes were counted. Then it was learned Richardson had defeated him by approximately 25,000 votes, and there is no question of doubt but that it was largely the motoring vote that brought this about. The State's Highway Commission had announced its needs as $12,000,000 annually for the next five years.

Under the law, if the highway commission received that sum, the same amount would have had to be raised for distribution among the counties, with a ten per cent allowance for the conduct of the motor vehicle department. This would have meant that if the commission received $12,000,000 a year as its share, the total amount motorists would be called upon to contribute would be $27,000,000, and in addition the Stephens lineup had advocated a gasoline tax.

New Lancia to Feature Paris Show in October

PARIS, Sept 12 (*By Mail*)—It is expected that the outstanding technical feature of the coming Paris show, which opens Oct. 4, will be the 122 in. frameless Lancia, weighing 1650 lb. complete, with four passenger body and capable of a speed of 70 m.p.h. It is a reasonably priced production job, and in the opinion of many it is the most important recent departure from standard practice. Lancia is negotiating for the sale of license in the United States.

Woodhouse's Effort Fails to Stop Races

Court Allows Aero Club Trophies to Leave New York State for Detroit

NEW YORK, Sept. 27—An effort made by Henry Woodhouse, formerly a governor of the Aero Club of America, to prevent the holding of the national airplane races in Detroit Oct. 7, 12, 13 and 14 by attempting to enjoin the removal from the state of the Pulitzer and Curtiss trophies was stopped by Justice McCook in the Supreme Court here to-day.

Woodhouse, in the last two or three years, has started half a dozen court actions to prevent the control of the Aero Club of America passing out of his hands. In the present suit he sought an injunction to prevent the two trophies, the Pulitzer and Curtiss, to be raced for at Detroit, from being taken out of New York State.

Request Refused

Justice McCook after a lengthy hearing refused this request. The trophies were in the custody of three trustees appointed to look after the assets of the Aero Club of America and these trustees were permitted to ship the trophies to Detroit, which means that the contests for them will be carried out.

To-day's hearing on the injunction served to bring into court many facts concerning the controversy over the Aero Club of America. In August, 1920, the club, being in financial difficulties, an effort was made by those interested in aircraft not only to redeem the debts of the club but make it a truly representative organization of the industry. Howard E. Coffin was one of the leaders in this movement and was supported by members of the Manufacturers Aircraft Association and others interested in the work.

Was Dominating Factor

Woodhouse previous to this time had been a dominating factor in the club's activities and it was considered necessary to get rid of him. Steps were taken that accomplished the reorganization of the club. Woodhouse declared in court that he represented 404 members and still contends that he is chairman of an administrative committee of the club. It is in this alleged capacity that he has been bringing court actions against those who are trying to build up some form of national aeronautical federation.

Last spring the affairs of the club were partly wound up. The clubhouse was discontinued and headquarters established in a room in the Automobile Club of America, where the trophies were placed. The other assets of the club were placed in storage warehouses.

It developed in court proceedings today that Woodhouse, who has been carrying on a very aggressive publicity propaganda against the aircraft manufacturers, as well as many individuals such as Howard E. Coffin, S. D. Waldon, and others, killed a man in 1905 and served a term of over three years in a New York prison. At the time he was a cook and killed a fellow workman in a kitchen. After serving his jail term he took out his final citizenship papers in 1917, it was brought out in court, but he made no reference to his criminal record, not even to those who vouched for his character. His name previously was Henry Casalegno, which he had changed to Henry Woodhouse.

Not only is Woodhouse charged with carrying on a campaign of publicity against the aircraft manufacturers and in general against those who worked for the good of aircraft during the war, but he has been feeding this propaganda to members of Congress, it is claimed.

Plan Aeronautical Body

It is planned to organize a national aeronautical association in Detroit, Mich., Oct. 12, 13 and 14. The formation of such an association is favored not only by the aircraft manufacturers but by such government groups as the United States Navy, the Army, Postoffice department, Bureau of Standards, National Advisory Committee for Aeronautics, the Aeronautical Chamber of Commerce, and the Society of Automotive Engineers. A program for its formation has been drafted and suggested by-laws prepared. In order to make such an association truly national the country has been divided into nine districts, based geographically on the military corps areas. Each area will send its instructed delegates to the convention.

ENGINEERS FAVORING OIL INSPECTION LAW

CLEVELAND, Sept. 25—Automotive construction engineers in this city have come forth in support of the state-wide demand in Ohio that an oil inspection law be enacted to protect users of automobiles from low grade gasoline.

The grade of gasoline in this city has declined since 1910, according to H. R. Matheny, chief engineer of the Winton Co. He said the decline has been shown by actual experience in the Winton plant. Tests made at the plant show that carbon must be removed from engines every 1000 miles. Some dealers advocate that it be done every 500 miles. Not long ago when gasoline tested around 56, an engine would go in good shape for 10,000 miles without having carbon removed.. Gasoline now tests 15 to 20 points lower than it did some years ago.

B. H. Anibal, chief engineer for the Peerless Motor Car Co., says the amount of kerosene in gasoline is increasing each year and favors weekly tests to determine the quality of gasoline used.

Detroit Air Cooled Buys Plant at Wayne

Has Capacity of 50 Cars Daily—Production of Line to Start in December

DETROIT, Sept. 27—Detroit Air Cooled Car Co. has purchased an assembly building in Wayne, near Detroit, in which it will begin production of its air-cooled line in December. The building will be used exclusively for car assembly and will have capacity for about 50 cars daily.

The financial plans of the company are about complete, according to President W. J. Doughty, and have advanced to such a point that arrangements for manufacturing are now being closed.

All of the parts for the car will be made by specialized unit makers, in almost every case being specially designed for the air-cooled line. Throughout, the engineering effort has been directed to the elimination of moving parts. The general accessibility of each unit has been the important consideration. Contracts for parts will be complete next week, many of the important units having already been closed.

The car will sell in the phaeton model for $1,250, the coupe for $1,700 and the sedan for $1,750. Bodies for the line have been specially designed. Contracts with distributors and dealers have been made in 40 important cities, and Doughty declares these will cover production for the first year.

Foreign Trade Contact Committee Meets Oct. 2

WASHINGTON, Sept. 27—Gordon Lee, chief of the Automotive Division of the Bureau of Foreign and Domestic Commerce, has called a meeting of the foreign trade contact committee of the various automotive associations to meet here on Oct. 2, for the first meeting of the 1922-23 winter season. This committee, formed last spring, has for its purpose the co-ordination of export activities in the various associations representing car, truck, motorcycle, equipment, airplane and marine engine fields.

"The markets abroad are picking up rapidly, and in every group of the automotive industry the possibilities are getting better every day," Lee declared. "Now that the division has been established for practically a year, I believe that the division will be in a position to accomplish some good things for the industry during the next twelve months."

NEW BUICK RECORD

FLINT, MICH., Sept. 27—During the week of Sept. 23 a new high point of production was reached by the Buick Motor Co., when the plants in this city and Detroit turned out a total of 4058 cars, which is an average for the five and one-half working days of 737 cars a day.

Olds Prices Reduced On All But One Line

Cut Made in Four-Cylinder and Light Eight Models—Large Eight Unchanged

LANSING, MICH., Sept. 26—The Olds Motor Works has announced a price reduction on the four cylinder and light eight models. Prices of the large eight models remain the same. The new prices are as follows:

	Old Price	New Price
Four Cylinder		
Roadster	$1,095	$955
Phaeton	1,095	975
Semi-Sport	1,225	1,075
Cal. Top Phaeton	1,395	1,350
Brougham	1,425	1,375
Coupe	1,595	1,475
Sedan	1,745	1,595
Light Eight		
Phaeton	1,495	1,375
Super-Sport	1,725	1,675
Sport Roadster	1,695	1,625
Coupe	1,995	1,875
Sedan	2,145	2,025

Ford of Canada Lowers Prices from $30 to $60

DETROIT, Sept. 27—The Ford Motor Co. of Canada, Ltd., has made reductions ranging from $30 to $60. The chassis now is $395; runabout, $455; phaeton, $495; truck chassis, $545; coupe, $780, and sedan, $870. Starting and electric lighting are standard on closed models. On all others $85 extra.

The Ford Motor Co. of Canada is independent of the American company though Henry Ford controls both plants. No price change on the American side is announced.

Production capacity of the Canadian plant is about 500 daily as compared with 5500 in United States. The Canadian car, because of structural differences and lower production rate, always has been higher in price than the United States car.

LOWER HAWKEYE LISTS

SIOUX CITY, IOWA, Sept. 26—New prices have been announced by the Hawkeye Truck Co., effective immediately. The schedule is as follows:

	Old Price	New Price
1 ton	$1,500	$1,375
1½ ton	1,850	1,645
2 ton	2,650	2,145

The 3½ ton and 5 ton models will be built on special order only.

APPLETON TRUCK FORMED

APPLETON, WIS., Sept. 25—The Appleton Motor Truck Co. has been incorporated with an initial capital of $25,000 by A. G. Brusewitz, M. Rossmeissl and W. G. Jamison for the purpose of manufacturing and dealing in motor vehicles, parts and equipment.

Brusewitz was one of the principal officers and stockholders in the Reliance Motor Truck Co. of Appleton, which a little more than a year ago was forced into bankruptcy through lack of adequate working capital for manufacturing the Reliance motor truck and axles for heavy duty vehicles. However, nothing definite concerning the plans of the new corporatioon has been made public.

EIGHT MONTHS OUTPUT PLACED AT 1,507,495

WASHINGTON, Sept. 26—During the month of August there were produced 246,941 automobiles and 24,064 motor trucks, according to figures compiled by the Census Bureau from reports of approximately 90 passenger car and 80 truck manufacturers. These figures are subject to slight revision when all reports are received.

The following table shows production for the first eight months of the year, the reports each month, with few exceptions, being from identical firms:

	Passenger Cars	Trucks	Total
Jan.	81,693	9,416	91,109
Feb.	109,171	13,195	122,366
March	152,959	19,761	172,720
April	197,216	22,342	219,558
May	232,431	23,788	256,219
June	263,027	25,984	289,011
July	224,057	21,357	245,414
Aug.	246,941	24,064	271,005
Grand total	1,507,495	159,907	1,667,402

Dealers Protest Early Announcement of Models

CHICAGO, Sept. 27—Acting upon the complaints received from a number of individual members, the Board of Directors of the Chicago Automobile Trade Association has adopted a resolution protesting against the announcement of manufacturers of their new models and new prices as much as six months in advance of the season for which they are intended.

It was stated that the association opposes the policy of mid-season announcement of new models and new prices because it has a tendency to slow up buying not only of the cars in question but of other cars as well.

Lansing's First Star Shipped to Utah Fair

DETROIT, Sept. 22—The first Star car to be turned out at the Lansing plant of the Durant Motor Co. has been shipped to the Intermountain Motor Sales Co., which will exhibit it at the Utah State Fair at Salt Lake City. The assembly lines for the Star are reported almost ready for production at the Lansing factory.

Sales of the Durant four are reported to be brisk, a trainload being shipped to Chicago this week, with other trainloads to be shipped to other points in the next few weeks.

Jordan Cuts Prices; Makes Some Changes

Closed Models Drop from $2,785 to $2,485—No Change Made in Open Cars

CLEVELAND, Sept. 25—Jordan Motor Car Co. announces a reduction of $300 in the prices of its brougham and sedan, the drop being from $2,785 to $2,485. No change has been made in the lists on the open models.

Several slight changes have been made in both these closed models. The sharp corner lines have been changed to a broomstick radius, roof lines have been lowered two inches and the seats dropped a corresponding amount. The rear seats are wider and the pitch changed slightly. Both bodies are now trimmed in Windsor weave cloth. In the brougham this cloth is worked in plain trim without pleats, but in the sedan pleats are used.

A worm type regulator replaces chains in the doors, while removable panels make it easy to get at the regulators. Platinum finish hardware is used in dome lights, door pulls and regulator handles. A new steering wheel with walnut spider and rim, similar to that used on the new Play Boy, is standard on both closed jobs, with small polished aluminum control levers mounted in the center.

The sedan body has been lengthened to allow more room in the front compartment and a little more in the tonneau. A large trunk has been mounted on the rear of the brougham, carrying two large suit cases and having an extra compartment for packages.

Hudson Prices Drop $120; Cut of $50 Made on Essex

DETROIT, Sept. 25—Another price reduction, effective Sept. 22, is announced by Hudson and Essex, which is the second within three months. The cuts do not affect the sedan and coupe in the Hudson line. The drops are $50 in Essex and $120 in Hudson. The new list:

	Old Price	New Price
Hudson		
4-pass. phaeton	$1,645	$1,525
7-pass. phaeton	1,695	1,575
Coupe	2,570	2,570
Sedan	2,295	2,295
Coach	1,745	1,625
Essex		
5-pass. phaeton	1,095	1,045
Cabriolet	1,195	1,145
Coach	1,295	1,245

It is announced that the Essex sedan has been discontinued.

GARY LISTS INCREASED

GARY IND., Sept. 26—The Gary Motor Corp. announces an increase in the prices of its trucks as follows:

	Old Price	New Price
Model F 1-1½ ton	$1,675	$1,775
Model I 2 ton	2,250	2,450
Model J 2½ ton	2,650	2,850
Model K 3½ ton	3,650	3,790
Model M 5 ton	4,100	4,450

FINANCIAL NOTES

Dayton Rubber Manufacturing Co.'s balance sheet as of Aug. 31 shows current assets, consisting of cash, receivables and merchandise, of $1,635,079 as against $1,778,962 as of June 30; miscellaneous assets of $3,033,950 compared with $3,058,833 and total debt, including accounts payable, notes payable, etc., of $716,176 contrasted with $933,441. The company reports that August sales showed a volume approximating $400,000 which places it the largest month in the company's history. Sales for the first eight months aggregated $2,500,000, more than for the entire year of 1921. September business is reported to be as good as August, with many orders booked. The plant has been working on a basis of twenty-four hours a day since Dec. 2, 1921.

Timken Roller Bearing Co. stock has made its first appearance on the New York exchange, selling around 30. Earnings in the current quarter will approximate $2,500,000 after charges and taxes, and added to earnings for the first half will approximate $6,600,000 for the nine months, or $5.50 a share on the 1,200,000 shares of par capital stock. Full year profits are expected to equal nearly $7 per share, more than twice current annual dividend requirements. Both company plants are working at capacity with no indications of a let-up.

Studebaker Corp. of America may declare an extra dividend when the directors meet Oct. 31. Financial quarters predict that it will be $1.50, as was given in July. Studebaker earnings, which will approximate $8.50 per common share in the current quarter, will bring the total to about $26.50 a share for the nine months. An October dividend equal to the July would mean a total distribution of $11.50 a share for the year, an amount earned twice over in the first nine months.

McCord Manufacturing Co. reports its plant is operating at 70 per cent capacity and gaining steadily. Body department is proceeding at 60 per cent while axle works are running low. Radiator, gasket and lubricating departments are normal. Net earnings for the first eight months were $500,000 and now are at the rate of $1,000,000 annually. Preferred dividends, discontinued fifteen months ago, have not been resumed.

Hayes Wheel Co. directors are expected to increase the dividend rate on the stock of the corporation to $3 per annum at the forthcoming meeting. Net earnings from Jan. 1 to Aug. 31 amounted to $763,499. It is said that the portion paid out has been $150,000 in dividends. Net working assets have increased $505,006 between Jan. 1 and Sept. 1.

Farm Equipment Makers Prepare for Convention

CHICAGO, Sept. 27—The complete program for the annual convention of the National Association of Farm Equipment Manufacturers which will be held in Chicago Oct. 18 to 20, has been announced. Among the speakers will be the following:

J. B. Bartholomew, president of the association; C. H. Markham, president of the Illinois Central Railroad; R. L. Lathrop, president of the National Federation of Implement Dealers Association; Guy H. Hall, director of The National Institute of Progressive Farming, and F. R. Todd, vice-president of Deere & Co.; T. F. Wharton, secretary of Deere & Co.; L. C. Pryor, editor Farm Implements and Tractors; Donald D. Conn, formerly chief of the transportation division, Joint Commission of Agricultural Inquiry; H. H. Stackhouse, general manager, French & Hecht; W. A. Durgin, chief of the division of simplified practice, Department of Commerce; Grant Wright, general secretary-treasurer, Eastern Federation of Implement Dealers Association, and James R. Howard, president, American Farm Bureau Federation.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

Last week, for the first time in a long period of low money rates, the trend was toward greater firmness. On Sept. 21, call money was quoted at 6 per cent, the highest rate since Feb. 23. The range for the week was 3½ per cent to 6 per cent, as compared with 4 per cent to 5 per cent in the preceding week. The firmer tendency was also noticeable in time money.

The rates for sixty and ninety days' maturities were 4½ per cent to 4¾ per cent, as compared with 4¼ per cent to 4½ per cent in the preceding week, while the rate for four, five and six months' maturities ranged from 4¾ per cent to 5 per cent, as compared with 4½ per cent to 4¾ per cent. The prime commercial rate was 4¼ per cent to 4½ per cent, as compared with 4 per cent to 4¼ per cent. The stiffening of money rates was ascribed chiefly to the rush of importers to get materials out of bond before Sept. 22, when the new high tariff went into effect.

In anticipation, apparently, of the new tariff schedule, the value of merchandise imports for August, amounting to $271,000,000, was the largest total for any month since November, 1919; 7.5 per cent larger than in July and 38 per cent above August a year ago. The excess of exports over imports for the month was $31,000,000, the smallest amount since September, 1915.

For the week of Sept. 16, the third week since the adjustment of the labor controversy in the industry, soft coal production was estimated at 9,500,000 tons against 8,756,000 tons in the preceding week and 9,359,000 tons for the week of Sept. 2. The failure to reach the 10,000,000 ton mark was attributed chiefly to car shortage and delayed transportation. The anthracite production for the week of Sept. 16 was estimated at 900,000 tons, as compared with 53,000 tons in the previous week.

White Co. Dividend

CLEVELAND, Sept. 28.—The White Co. on Sept. 30 will mail to stockholders a dividend at the rate of $1 a share. Quarterly earnings from Jan. 1 to Aug. 31 have exceeded dividend requirements for the entire year and a continued improvement in business is indicated by the volume of orders on hand and in prospect.

Middle Priced Cars Fall Off in Output

Smaller Companies Will Show Decline for September—Light Trucks Moving

DETROIT, Sept. 27—The automobile industry is tapering off in production, this being especially true in the middle priced field. In the high priced and low priced cars there continues to be a large volume of buying, and in at least two cases in the middle priced, the buying still is around the capacity of earlier peak months. The dropping off in production figures which will be visualized in the September reports will represent losses which have been sustained by the smaller companies in the medium priced field, the leaders continuing to hold a large share of early business. In every factory, however, there has been a lessening of production and a laying off of employees.

Some Schedules Drop

Companies in the high priced fields which have declared themselves sold to the first of the year are laying off men in small numbers and schedules in medium priced cars generally have dropped from 20 to 50 per cent. Factory sales managers are turning their efforts toward the cities on both seaboards, and the middle west and the southeastern section of the country to sustain operations on a sizable scale during the fall and winter.

Most of the buying in farm districts, aside from the southeast, is in low priced cars, due to the low yield to the farmer. Substantial farmers are expected to come into the market in the spring.

Truck factories are finding the largest volume of business in light trucks. The coal situation has created a market for light trucks, which manufacturers are urging their dealers to follow up. Much of the domestic coal during the winter will be sold in small quantities, making a definite market for small, speedy delivery vehicles. With practically all business on a smaller scale than usual, light trucks are meeting requirements for the present.

Standard Parts Pays Creditors 5 Per Cent

CLEVELAND, Sept. 28.—Creditors of the Standard Parts Co., a $20,000,000 automobile accessory manufacturing plant which went into the hands of a receiver on Sept. 1, 1920, will receive shortly a payment of 5 per cent of their claims. Federal Judge D. C. Westenhaver today directed that the payment, which will total $500,000, be made. The sum will come from earnings of the company which has shared with other similar plants in the prosperity which the automobile industry has enjoyed in the last 12 months.

Receiver Frank A. Scott has paid a total of 25 per cent of claims to creditors.

S. A. E. Will Discuss Production Methods

Papers Being Prepared for October Meeting—Paper on Oil for Detroit

DETROIT, Sep.. 23—Papers on production methods will be presented by Studebaker, Packard, Ford and the General Motors Corp. at the first annual production meeting of the Society of Automotive Engineers, scheduled for Oct. 26 and 27 in this city. Two other companies, at least, will have papers for this session.

The papers will represent a symposium of practical ideas on production from the chief production men of each company rather than from an individual. This feature is new to S. A. E. papers and adds considerable interest to the coming meeting.

The morning sessions will be devoted to the technical sessions. Factories that will be visited in the afternoons include Cadillac, Packard, Dodge Brothers and the Ford River Rouge plant. The dinner will be held on Thursday evening at the Hotel Statler.

Detroit Section Meeting

The Detroit Section of the Society will open the fall season, Sept. 29, with a paper by A. A. Bull of the Northway Motor & Manufacturing Co. on "Oil Consumption." This paper was originally presented at the summer meeting of the Society at White Sulphur Springs. There was not sufficient time then for a thorough discussion, and the Detroit section is having the paper presented again in order to afford the opportunity of having subject of common interest very thoroughly argued.

The object of the paper is to consider some of the fundamental factors that affect oil consumption, according to the summary given by the author. It does not dwell upon the differences between lubricating systems. Beyond the fact that different oils apparently affect the oil consumption, and that there is a definite relation between viscosity and oil consumption, the effect of the physical characteristic, or the quality of oil, does not receive particular attention.

Dayton Meeting

The members of the Dayton section will meet at the Dayton Engineers Club on Oct. 3 to hear C. F. Kettering, president of the General Motors Research Corp., speak on "Some Problems Confronting the Automotive Engineer."

Washington Opens Year

The Washington section will start its year with a meeting on Oct. 5 at the Cosmos Club. R. E. Carlson of the Bureau of Standards staff will read a paper on "A Road Test Method for Comparing Motor Fuels." Carlson is engaged in the conduct of the road tests now being run at the bureau in connection with the Society's fuel volatility research project. He will describe the methods and apparatus employed in this work and give some idea of the conclusions that may be deduced from the data recorded.

Minneapolis Section

The Minneapolis section will open the season with a technical meeting on Oct. 4, at the Manufacturers Club. N. S. Kingsley, who is connected with the Standard Oil Co. of Indiana, will present a paper on "The Manufacture of Petroleum Products for Automotive Uses." H. S. Morton will also present a paper on "Front Wheel and Four Wheel Braking."

INDUSTRIAL NOTES

Wheary-Burge Truck Co. has been incorporated for $500,000 at Racine, Wis., to make special trunks and baggage merchandise for the motor car trade in addition to its main line of patented wardrobe trunks. George W. Wheary, for 19 years associated with the Hartmann Trunk Co., Racine, resigned recently as vice-president and general manager to form the new corporation. Harry L. Burge, until now general western sales manager of the Hartmann company, is associated with Wheary. A plant is now being equipped on three floors of the Racine Industrial Community building at Racine Junction, near the Mitchell Motors Co. and Racine Rubber Co. (Ajax) factories.

Star Rubber Co., Akron, is ahead of all previous records in production and sales. July and August formed the largest 60-day period to date. September totals, while known to be gratifyingly large, are not available at present. Star reports a particularly heavy demand during the past 60 days for straight side Meteor cords. This tire is made in all sizes up to 38 x 7. No additions to the Star line are contemplated at present by company officials.

Angle Steel Stool Co. which was established about 11 years ago at Otsego, Mich. has moved to its new day light factory at Plainwell, Mich., the removal being due to the need of an opportunity for expansion. The new location will permit the company to make its shipments over two steam and an electric road. C. E. Pipp is president and general manager.

Austin Manufacturing Co., Chicago, has contracted to handle sales of tractor and road maintaining machinery of the Wilson Tractor Co., Ottawa, Iowa. Many individuals of the Wilson organization will be transferred to the Austin force through the arrangement.

The Davis Boring Tool Co. has purchased a factory site in St. Louis, fronting on Forest Park Boulevard, on the corner of Spring Avenue. Preliminary work is now under way for the erection of a modern three-story daylight factory.

GRAY JOINS N. A. C. C.

NEW YORK, Sept. 26—Gray Motor Corp. has been elected to membership in the National Automobile Chamber of Commerce and will exhibit its various styles of Gray cars at the New York and Chicago automobile shows.

METAL MARKETS

The motley condition which of late has prevailed in the iron and steel markets is beginning to give way to a somewhat more orderly state of affairs. Fresh buying is at a tonnage rate that does not make up for the shipments leaving mills. The latter in spite of all transportation difficulties arising partly out of car shortage and partly out of embargoes exceed new bookings. Consumers are even more insistent than they were while the railroad shopmen's and coal miners' strikes were in full swing that mills make heavier deliveries on account of standing contracts. It seems almost as though they wanted to have all steel bought at what now seem like low prices in their own hands. At the same time there is impressively little, if any, disposition on the part of buyers to replace filled orders with new ones.

What light amount of business is forthcoming is of the "hand-to-mouth," "expect-prices-to-be-lower" sort. For all that, neither producers nor consumers look for any spectacular price changes over the year's three remaining months. If the aggregate of business should suffice for a continuing operation of steel mills at 60 to 75 per cent of their capacity, gradual elimination of delivery premiums will ensue without basic prices being affected. The keenest market observers consider further liquidation of steel prices as having been deferred until 1923, when they hold that the process of deflation which set in two years ago and which lately has been interrupted as the result of the strikes will be resumed.

If deflation of steel prices is to be a genuine affair and not merely an ephemeral weakness of the market, it must be preceded by a sufficient buying movement to allow of a rate of mill operations that will make possible economies in production that are out of the question unless mills operate at more nearly their capacity. While the general expectation is for a gradual shading off in prices, it must be borne in mind in judging the market's future course that production costs have undergone a sharp advance as the result of wage increases which it will be very difficult to readjust on a lower basis in the near future. Steel producers recognize more so than any other class of manufacturers that one of the principal reasons why their products are selling at abnormally high prices is the scarcity of labor.

Pig Iron.—Many automotive foundries have been showing a tendency of late to let their pig iron reserve run so low that when they must enter the market they lack the requisite time to make certain of lowest prices and are thus frequently compelled to pay the penalties that attach to distress tonnages. The general feeling in the trade is that the market is topheavy and that from now on it will gradually give way to more reasonable levels.

Aluminum.—The chief question before the aluminum market now is how long a time will elapse before the domestic producer revises prices upwards so as to take advantage of the protection afforded to the American industry by the Fordney-McCumber tariff law. The heavy stocks of imported ingot metal are expected to serve for some time to come as a brake on too sharp advances for that description. The situation with reference to sheets, however, is different and the domestic producer is now really in a position to dictate the price for rolled metal.

Copper.—Quiet and easy.

Calendar

SHOWS

Sept. 23-30—New York, Closed Car Show, Grand Central Palace.

Oct. 7-14—New York, Electrical and Industrial Exposition, Grand Central Palace.

Oct. 21-28—Washington, D. C., Annual Closed Car Salon, Convention Hall, under the auspices of the Washington Automotive Trade Association.

Nov. 13-18 — Chicago, Annual Show and Meeting of the Automotive Equipment Association.

Dec. 3-9—New York, Eighteenth Annual Automobile Salon, Commodore Hotel.

Jan. 6-13—New York, National Automobile Show, Grand Central Palace, under auspices of National Automobile Chamber of Commerce.

Jan. 8-13 — New York Body Builders Show, Twelfth Regiment Armory, under the auspices of the Automobile Body Builders Association.

Jan. 27-Feb. 3—Chicago, Annual Automobile Salon.

Jan. 27 - Feb. 3 — Chicago, National Automobile Show, under auspices of National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

FOREIGN SHOWS

Sept. 1922 — Rio de Janeiro, Brazil, Automobile Exhibits in Connection with the Brazilian Centenary Associação Automobilista Brazileria.

Oct. 4-15 — Paris, Automobile Show, Grand Palais.

Nov. 3-11 — London (Olympia), Automobile Show.

Nov. 9 - 19 — Buenos Aires, Argentina, Annual Exhibition, Automovil Club Argentino.

Nov. 29-Dec. 4—London (Olympia), Cycle and Motorcycle Show. British Cycle Motors, The Tower, Warwick Road, Coventry.

Jan. 13-24—Brussels, Sixteenth International Automobile and Cycle Exposition, Palais du Conquantenaire.

CONVENTIONS

Oct. 2-7—Detroit, Fourth International Steel Exposition and Convention of the American Society for Steel Treating and the American Drop Forging Institute, General Motors Building.

Oct. 7-14—Detroit, Second National Aero Congress and National Airplane Races.

Oct. 9-11—Chicago, Annual Convention of the American Gear Manufacturers Association.

Oct. 18-20—Chicago, National Association of Farm Equipment Manufacturers, Congress Hotel.

Oct. 26-28—Washington, Second National Conference for the Study of Highway Engineering and Highway Transport Education.

S. A. E. MEETINGS

Sept. 29—Detroit Section, Lubrication, A. A. Bull.

Oct. 3—Dayton Section—Dayton Engineers Club.

Oct. 3—Dayton Section, Dayton Engineers Club, "Some Problems Confronting the Automotive Engineer," C. F. Kettering.

Oct. 4—Minneapolis Section, Manufacturers Club, "Manufacture of Petroleum Products for Automotive Uses," N. S. Kingsley; "Front Wheel and Four Wheel Braking," H. S. Morton.

Oct. 5—Washington Section, Cosmos Club, "A Road Test Method for Comparing Motor-Fuels," R. E. Carlson.

Oct. 6 — Aberdeen Proving Ground, Md.

Oct. 26-27 — Detroit, General Motors Building.

Jan. 9-12—New York, Annual Meeting.

New York Hears Lens Makers on State Law

ALBANY, N. Y., Sept. 26—Hearings on the orders to show cause why State approval, granted in the past to more than 70 anti-glare automobile headlight devices, should not be revoked was begun to-day before Judge Walter H. Knapp, of the State tax commission. Six manufacturers of headlight devices upon which notice had been served appeared, and more are expected to-morrow when the hearing will be continued.

Several methods of enforcing anti-glare headlight regulations, under the new State law, were discussed. Suggestions made included a greatly increased State police force, especially trained, establishment of State testing stations and licensing of reputable garages passing required tests to aid car owners in testing and adjusting their headlight lenses and devices.

Old Types Removed

Dr. Max Poser, representing the Bausch & Lomb Optical Co. of Rochester, offered no objection to the withdrawal of the old type of Bausch & Lomb lens, stating that only a few of them were made, for test purposes. The later type is approved by the State. The same situation was found with the Shaler roadlighter and the Benzer lens. The new types of both lenses are approved, and there was no objection to the withdrawal of approval from the old type. Frederick H. Ford and R. E. Malone represented the C. A. Shaler Co. of Wampun, Wis., and J. A. Berkman, represented the Benzer Corp. of Brooklyn.

Edward Lyndon appeared for the C. and A. Mattise Corp. of New York City, manufacturer of non-glare lenses. It was found that this lens, under the name of Mattise, has been approved in Massachusetts, whose standards are the same as the New York standard. This lens, therefore, will be approved upon the filing of a statement from the testing laboratory that the lenses are the same.

Minna Vatter of New York City, manufacturer of the Deflecto device, and N. A. Siraco of the Siraco-Hammond Co. of Whitehall, manufacturer of the Eureka-Lunette device, were told that their devices could not be approved unless they complied with the provisions of the new tests as applied by the electrical testing laboratory of the United States Bureau of Standards.

Judge Knapp put forward as a possibility in enforcing the law the licensing by the State of reputable garages to examine car owners' lenses and devices and issue certificates for a small fee, to the effect that they comply with the State regulations, which certificates would be attached to the application for motor vehicle license.

One of the important features of the question which has been approached by the commission, Judge Knapp said, is the candlepower of bulbs. The commission has established the rule that all bulbs must be 21 candlepower.

NEW CANADIAN RULING

NEW YORK, Sept. 26—A Canadian ruling, effective Oct. 1, requires that the shipper's invoice indicate the country of manufacture or production, as to all imports and that the shipper certify that each article covered by his invoice is the product of the country specified. Under the new form of invoice the former ruling of the Canadian Customs that the American exporter must certify that the fair market value shown on his invoice was not lower than the wholesale price, or lower than the actual cost of production at the time or place of shipment, plus a reasonable profit, has been removed.

Rail Representative Blames Motor Buses

WASHINGTON, Sept. 27—The most direct cause for the falling off in passenger traffic on railroads has been due to the new and growing competition of hundreds of motor bus lines which have been built up in every State in the Union, and the millions of privately owned automobiles, declared C. A. Fox, chairman of the Central Passenger Association, representing 166 railroads, in the course of cross examination before the Interstate Commerce Commission to-day. This testimony was given in the hearing on the proposed interchangeable mileage plan which is vigorously opposed by the railroads and as strongly supported by the travelers' organizations. Fox says:

Private Cars Affect Roads

The fares of the bus lines are in some cases lower and in other cases they are the same or higher than the rail fares, but, regardless thereof, they are a controlling factor in handling this short haul traffic for the reason they pick up and deliver passengers, taking them from the main streets of the originating points to the main streets at destinations, and the service is so frequent that it diverts traffic from the rail carriers.

Millions of individually owned motor cars also make inroads on the local and through traffic of the carriers, which has been lost for some time.

Instead of any prospective alleviation of these difficulties, the losses from these causes undoubtedly will continue to grow because of the vast amount of money being expended in every state in the union in the improvement of the public roads.

Fare Reduction Not Wanted

For these reasons it is not believed a reduction in fares by means of reduced rate mileage or scrip tickets would have the effect of restoring to the rail carriers any considerable volume of this traffic now handled either by bus lines or in privately owned automobiles.